DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

SEWER STUDY
FOR THE SOUTHWEST VILLAGE
VTM 1 PROJECT IN THE
CITY OF SAN DIEGO
PTS# 614791

August 22, 2024

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

SEWER STUDY
FOR THE SOUTHWEST VILLAGE
VTM 1 PROJECT IN THE
CITY OF SAN DIEGO
PTS# 614791

August 22, 2024

8-22-2024

Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
760-438-4422

Job No. 648-031

TABLE OF CONTENTS

PAGE NO.

Introduction....1
Sewer System Design Criteria....2
Sewer Generation Rates....2
Peaking Factors....5
Manning's "n"....5
Depth and Velocity of Flow in Gravity Sewers....6
Existing Sewer System....6
Otay Mesa Trunk Sewer....6
Overview of Proposed Sewer Service....8
Onsite Sewer System....8
Onsite Public Sewer System Slopes....11
Onsite Private Sewer System Slopes....11
Phase 1 Sewer System....11
Onsite Public Sewer System Analysis....11
Offsite Flows Conveyed Through the Southwest Village VTM 1 Project....11
Onsite Analysis....12
Southwest Village VTM 1 Project Offsite Sewer Analysis – Otay Mesa Trunk Sewer....12
Existing Otay Mesa Trunk Sewer Downstream Capacity....12
Offsite Sewer Upgrades....14
Conclusions and Recommendations....14

APPENDICES

APPENDIX A	SOUTHWEST VILLAGE VTM 1 ONSITE SEWER ANALYSIS CALCULATION SPREADSHEET RESULTS
APPENDIX B	SOUTHWEST VILLAGE VTM 1 OFFSITE SEWER ANALYSIS CALCULATION SPREADSHEET RESULTS
APPENDIX C	CITY OF SAN DIEGO 2018 FLOW MONITORING RESULTS FOR THE OTAY MESA TRUNK SEWER
APPENDIX D	CITY OF SAN DIEGO COMMENTS AND RESPONSES
EXHIBIT A	MANHOLE NUMBER DIAGRAM

LIST OF TABLES

PAGE NO.

TABLE 1 SOUTHWEST VILLAGE VTM 1 PROJECT
AVERAGE DRY WEATHER SEWER FLOWS.....4

LIST OF FIGURES

PAGE NO.

FIGURE 1 LOCATION MAP 3

FIGURE 2 EXISTING SEWER SYSTEM 7

FIGURE 3 PROPOSED ULTIMATE ONSITE SEWER SYSTEM 9

FIGURE 4 PROPOSED VTM 1 ONSITE SEWER SYSTEM 10

DEXTER WILSON ENGINEERING, INC.

DEXTER S. WILSON, P.E.
ANDREW M. OVEN, P.E.
NATALIE J. FRASCHETTI, P.E.
STEVEN J. HENDERSON, P.E.
FERNANDO FREGOSO, P.E.
KATHLEEN H. NOEL, P.E.
WILLIAM W. TODD, P.E.

August 22, 2024 648-031

Tri Pointe Homes
13400 Sabre Springs Parkway, Suite 200
San Diego, CA 92128

Attention: Allen Kashani, P.E., Senior Project Manager

Subject: Sewer Study for the Southwest Village VTM 1 Project in the City of San Diego

Introduction

This report provides a public sewer study for the Southwest Village Vesting Tentative Map (VTM) 1 project in the City of San Diego and is a supplement to the overall "Southwest Village Specific Plan Sewer Study" which has been concurrently submitted to the City. This report addresses the public sewer system improvements specifically within and contingent to the VTM 1 area.

This report is an update of the previous "Southwest Village VTM 1 Sewer Study" dated June 14, 2024 and incorporates previous City comments that were issued. The specific City comments and responses are included in Appendix D of this report.

VTM 1 is located in the future Southwest Village Specific Plan area within the Otay Mesa neighborhood along an extension of Beyer Boulevard and west of a future extension of Caliente Avenue. Figure 1 provides a location map for the project.

A total of 920 dwelling units are planned for VTM 1 which are fewer than what was stated in the Southwest Village Specific Plan sewer study. The "Southwest Village Specific Plan Sewer Study" planned for 1,315 units for the VTM 1 area.

The Southwest Village VTM 1 project will receive sewer service from the City of San Diego. This letter report will address the sizing of the gravity sewer lines within the Southwest Village VTM 1 development, as well as the available capacity of the existing offsite gravity sewer system downstream of the Southwest Village VTM 1 project.

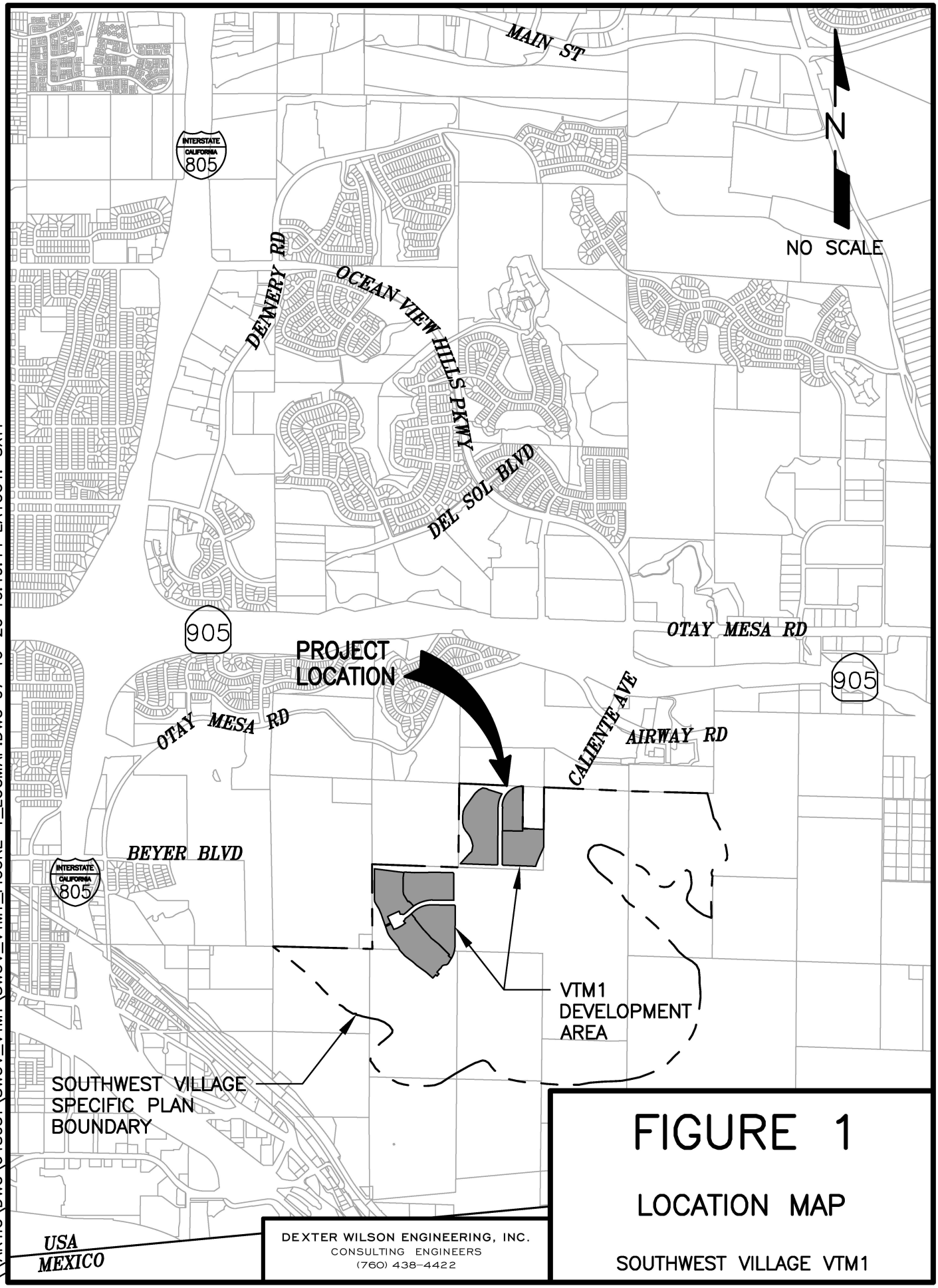
Sewer System Design Criteria

The design criteria used for the evaluation of the onsite and offsite sewerage system impacts by the Southwest Village VTM 1 project are based on the 2015 City of San Diego Sewer Design Guide (Sewer Design Guide). The City's Sewer Field Book and the "Southwest Village Specific Plan Sewer Study" were used for verification and confirmation of existing wastewater facilities surrounding the project.

Sewer Generation Rates

Sewage generation estimates were developed in accordance with the Sewer Design Guide and are based on population. Table 1-1 from the Sewer Design Guide was used to estimate the population for the Southwest Village VTM 1 project. Section 1.3.2.2 of the Sewer Design Guide uses a generation rate of 80 gallons per capita per day (gpcpd) to determine average dry weather flow (ADWF).

Dwelling unit density and net area information for VTM 1, along with Table 1-1 in the Sewer Design Guide, was used to determine the population for each residential area within VTM 1.



\ARTIC\DWG\648031\SWOV_VTM1\SWOV_VTM1_FIGURE-1_LOCMAP.DWG 07-16-20 10:19:14 LAYOUT: 8X11

FIGURE 1

LOCATION MAP

SOUTHWEST VILLAGE VTM1

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

Unit density and dwelling unit information was used to estimate population. The population estimates and the generation rate of 80 gpcpd were used to estimate the average dry weather flow (ADWF) for VTM 1.

Table 1 presents the projected average dry weather sewer flow within the Southwest Village VTM 1 project.

TABLE 1
SOUTHWEST VILLAGE VTM 1 PROJECT
AVERAGE DRY WEATHER SEWER FLOWS

Residential Planning Area	Dwelling Units	Dwelling Unit Density, DU/net-ac	Unit Density, Pop./DU	Total Population	Average Dry Weather Flow, gpd
8	185	26.1	3.0	555	44,400
9	95	21.6	3.1	295	23,600
10	130	10.7	3.4	442	35,360
11	168	17.1	3.2	538	43,040
12	76	11.2	3.1	236	18,880
13	170	17.0	3.2	544	43,520
14	96	10.5	3.4	326	26,080
TOTAL	**920**	**--**	**--**	**2,936**	**234,880**

Peaking Factors

The peaking factor for peak dry weather flow (PDWF) is dependent upon the equivalent population in the area upstream of, and including, the reach being analyzed. Figure 1-1 from the Sewer Design Guide was used to determine the peak dry weather peaking factor for each reach of pipe being analyzed for the Southwest Village VTM 1 project. The peaking factor for PDWF is the ratio of PDWF to ADWF. The dry weather peaking factor for the Southwest Village VTM 1 project is 2.15 based on a total project population of 2,936 people.

The peak dry weather flow for the Southwest Village VTM 1 project is 504,992 gpd.

The peaking factor for peak wet weather flow (PWWF) for the Southwest Village VTM 1 project being used for the analysis of both the onsite public gravity sewer collector system as well as for the onsite private sewer systems is 1.0. These onsite systems will be sized based on Peak Dry Weather Flow.

The analysis of the existing offsite Otay Mesa Trunk Sewer (OMTS) has been completed by other City of San Diego regional sewer studies within the Otay Mesa Trunk Sewer sub-basin. The PWWF peaking factor stated in those studies is 1.85.

Manning's "n"

The gravity sewer analyses are made using a computer program which uses the Manning Equation for all of its calculations. The Manning's "n" used by the computer program is held as a constant for all depths in a circular conduit. The value of Manning's "n" used for this study is 0.013 which is the value specified in Section 1.3.3.1 of the Sewer Design Guide.

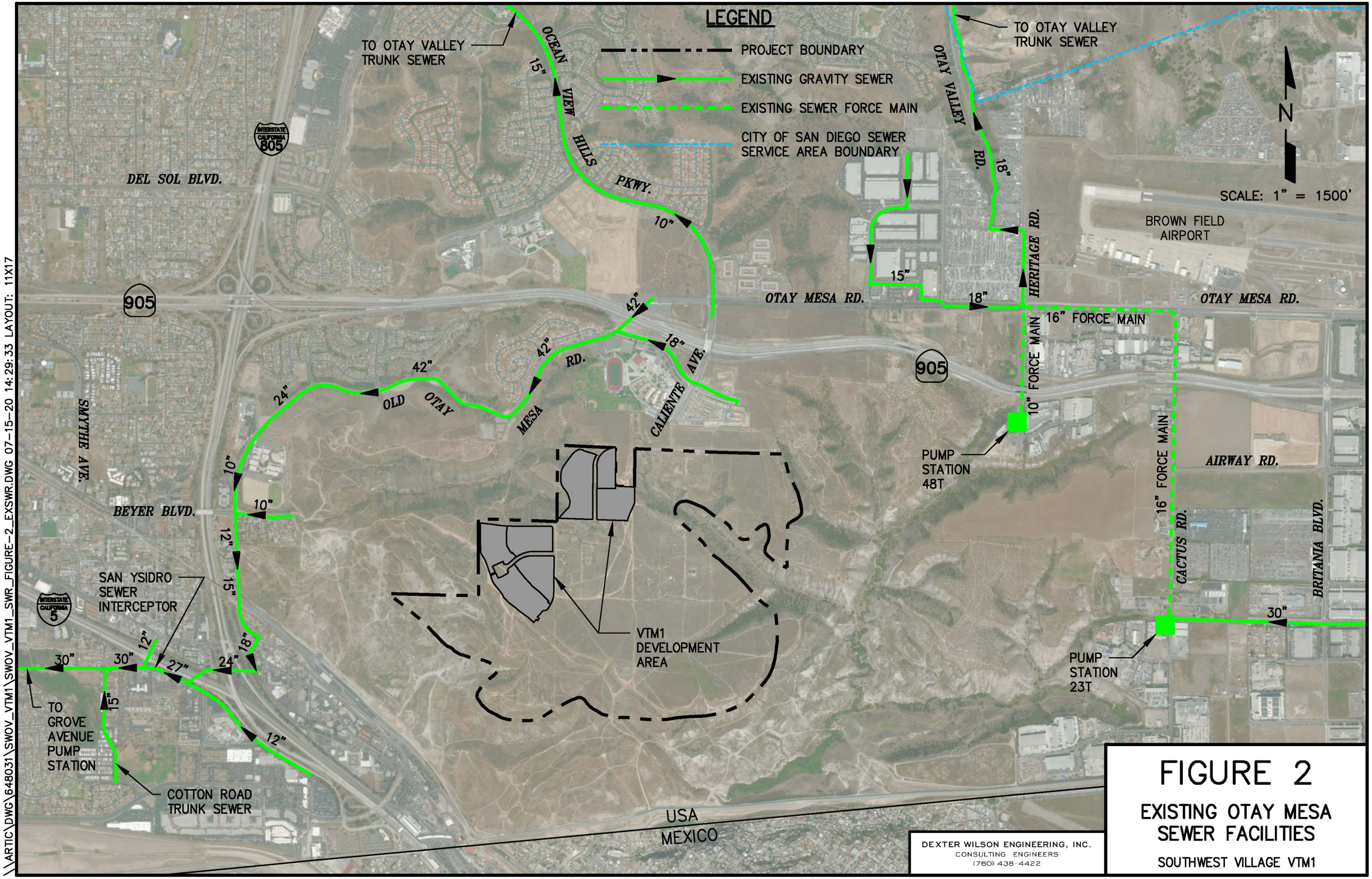
Depth and Velocity of Flow in Gravity Sewers

Gravity sewer lines are designed to convey peak wet weather flow. New sewer lines that are 15-inches in diameter and smaller are designed to convey this flow with a maximum depth-to-diameter (d/D) ratio of 0.50. New sewer lines that are 18-inches in diameter and larger are designed for a maximum d/D ratio of 0.75. Gravity sewer lines are designed to maintain a minimum velocity of 2.0 feet per second at peak wet weather flow to prevent the deposition of solids. At upstream-most segments of gravity sewer, slopes are set a one (1) percent minimum since the desired flow velocity of 2 fps may not be achievable because of few homes connected.

Existing Sewer System

Figure 2 presents the existing sewer facilities in the vicinity of the Southwest Village VTM 1 project. The existing public sewer system includes the Otay Mesa Trunk Sewer west of the project site to which the project will sewer. The Southwest Village VTM 1 project is proposing to convey and connect to the existing 10-inch diameter sewer line in Beyer Boulevard. This proposed connection location for VTM 1 precedes the Otay Mesa Trunk Sewer at the Beyer Boulevard and Otay Mesa Road intersection by approximately 1,000 feet.

Otay Mesa Trunk Sewer. The Otay Mesa Trunk Sewer is approximately one mile west of the project and conveys the partial sewer flow from the Otay Mesa community. The Otay Mesa Trunk Sewer consists of a range of pipe sizes from 10-inch diameter up to 42-inch diameter.



\\ARTIC\DWG\648031\SWOV_VTM1\SWOV_VTM1_SWR_FIGURE-2_EXSWR.DWG 07-15-20 14:29:33 LAYOUT: 11X17

FIGURE 2

EXISTING OTAY MESA SEWER FACILITIES

SOUTHWEST VILLAGE VTM1

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

Overview of Proposed Sewer Service

Onsite sewer facilities for the Southwest Village VTM 1 project are proposed to be a combination of public and private facilities. The onsite gravity sewer system flows to proposed Beyer Boulevard and generally east to west.

Onsite Sewer System. Figure 3 and Figure 4 present the proposed sewer system configuration and pipe sizing for the onsite sewer system to serve the Southwest Village VTM 1 project. The project's onsite public sewer system will be composed of 8-inch, 12-inch, 15-inch, and 18-inch gravity sewer piping. The entire Southwest Village VTM 1 project can be served by a gravity sewer system. No public sewer lift stations are proposed for the Southwest Village VTM 1 project. Figure 4 presents the proposed sewer system for VTM 1 only.

The onsite public sewer system includes a new 15-inch and 18-inch diameter trunk sewer line in Beyer Boulevard and West Avenue which will serve not only the VTM 1 project but the entire Southwest Village Specific Plan area. The 18-inch gravity sewer piping is necessary for select segments on the western end of proposed Beyer Boulevard due to velocities at Specific Plan buildout being greater than 10 fps. The City requires SDR 18 PVC for gravity sewer segments where velocities exceed 10 fps and SDR 18 PVC is not available in 15-inch diameter but is available as 18-inch diameter. Channelization will be required at the 18-inch to 10-inch manhole transition in Beyer Boulevard to alleviate hydraulic jump and bottlenecking for laminar flow purposes. Channelization will mitigate turbulent flow conditions as well as sewer odor issues.

Ultimate flows from the Southwest Village Specific Plan area will be conveyed through the VTM 1 area in the future by a combination of gravity and pump station conveyance components. These ultimate Specific Plan area components are shown on Figure 3 for reference. Furthermore, wastewater from the Southwind project may flow to the new trunk sewer line in Beyer Boulevard.

More information and hydraulic analyses concerning the ultimate sewer system for the Southwest Village Specific Plan area are included in a separate study titled "Southwest Village Specific Plan Sewer Study."

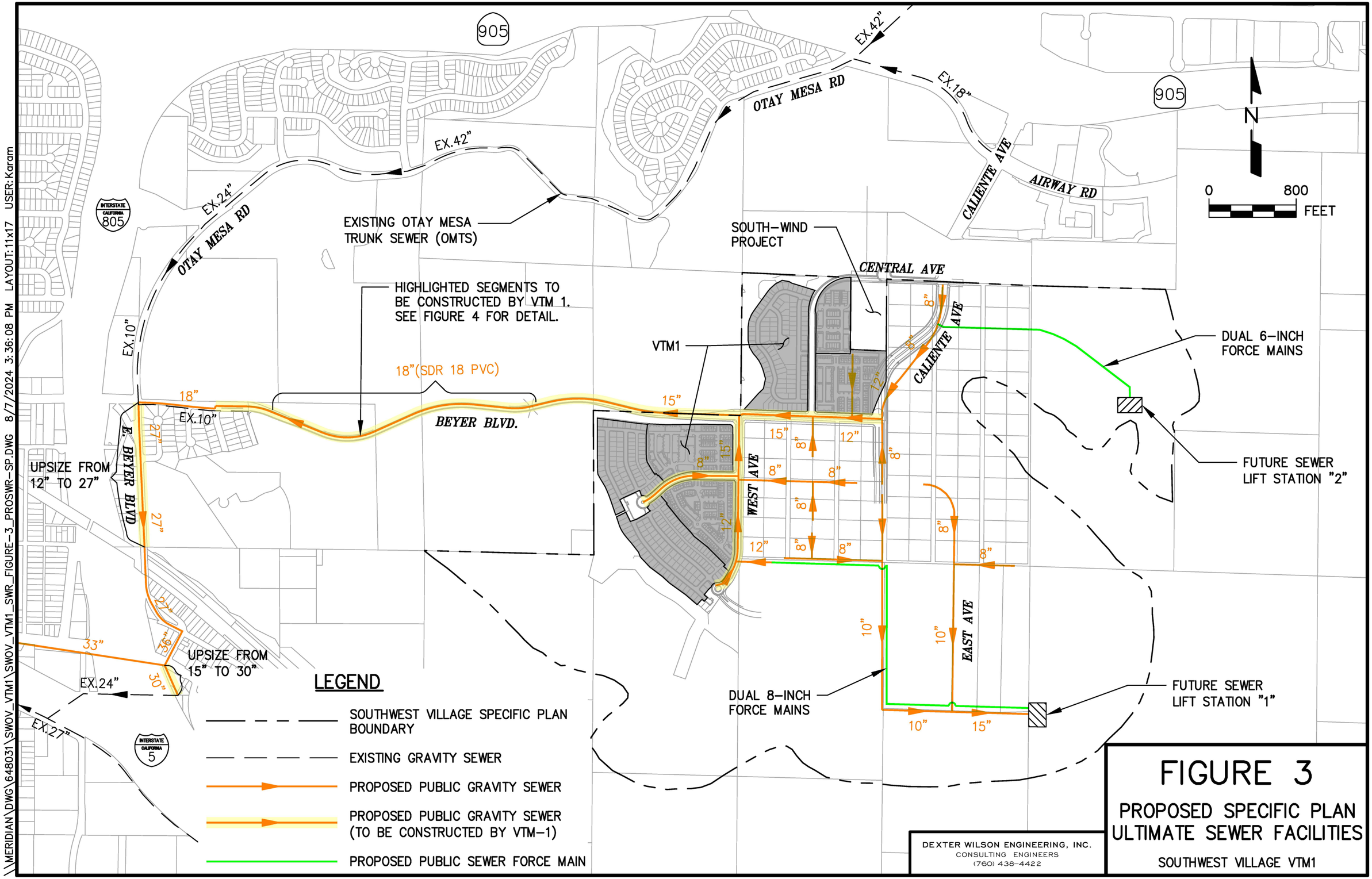


FIGURE 3

PROPOSED SPECIFIC PLAN ULTIMATE SEWER FACILITIES

SOUTHWEST VILLAGE VTM1

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

LEGEND

PROJECT BOUNDARY

PROPOSED PUBLIC SEWER

PROPOSED PRIVATE SEWER

SOUTHWIND PROJECT

CENTRAL AVE

CALIENTE AVE

SEWER STUB TO SOUTHWIND PROJECT

PA-9

PA-10

PA-8

HIGHLIGHTED PROPOSED PUBLIC SEWER TO BE LOCATED IN 26' WIDE EASEMENT

18"(SDR 18 PVC)

PROPOSED BEYER BLVD

CONNECTS TO EXISTING 10" PUBLIC SEWER LINE IN EXISTING BEYER BOULEVARD (PROVIDE MANHOLE CHANNELIZATION FOR LAMINAR FLOW AT THE 18"/10" CONNECTION)

15"

15"

15"

12"

PA-12

PA-11

STREET "A"

8"

8"

15"

PA-13

WEST AVE

12"

PA-14

12"

PROPOSED CALIENTE AVE

N

0 400 FEET

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 4

PROPOSED VTM 1 SEWER SYSTEM

SOUTHWEST VILLAGE VTM1

Onsite Public Sewer System Slopes. For the Southwest Village VTM 1 project Tentative Map submittal, onsite sewer line slopes have been calculated. The onsite sewer analysis presented in this report is based on the tentative map sewer slopes. Depths of proposed public sewer lines have also been determined based on the tentative map design; manhole inverts, rim elevations, and depths are provided on Exhibit A related to the onsite public sewer system analyses which will be discussed later in this report.

Onsite Private Sewer System Slopes. Many of the internal streets within the residential areas are proposed to have private onsite sewer systems. These systems will be designed to maintain a minimum of one (1) percent slope to meet plumbing code standards. Alternatively, the private sewer systems within the residential areas may be designed in accordance with the City of San Diego Sewer Design Guide.

Phase 1 Sewer System. Phase 1 of VTM 1 is comprised of its first 800 units. Phase 1 is analyzed under a separate study titled "Addendum No. 1 to the Sewer Study for the Southwest Village VTM 1 Project in the City of San Diego, PTS# 614791."

Onsite Public Sewer System Analysis

The onsite public sewer analysis consists of calculating peak dry weather flows within all segments of the onsite public sewer for the Southwest Village VTM 1 project. Peak wet weather flow was only included for existing offsite sewer lines per a City comment. As indicated earlier, gravity sewer slopes for the onsite proposed public sewer lines are based on the tentative map design. Flow in each sewer segment is calculated using the residential dwelling units in each development area and the average sewage flow generated in Table 1 in this report.

Offsite Flows Conveyed Through the Southwest Village VTM 1 Project. As stated previously, ultimate offsite flows from the Southwest Village Specific Plan area will be conveyed through the VTM 1 area in the future by a combination of gravity and pump station conveyance components. More information and hydraulic analyses concerning these future offsite flows for the Southwest Village Specific Plan area are included in a separate study titled "Southwest Village Specific Plan Sewer Study." This sewer study for VTM 1 presents

the adjacent Southwind project flows and their conveyance through a proposed easement aligned through Planning Area 8 in Southwest Village.

Onsite Analysis. The Southwest Village VTM 1 project onsite sewer analyses are presented as a spreadsheet calculation in Appendix A. The proposed gravity sewer pipe sizes and slopes result in a maximum depth/diameter of 0.35. The Sewer Manhole Number Diagram is presented as Exhibit A. Required pipe sizes are shown in Exhibit A, Figure 3, and Figure 4. The required onsite public gravity sewer pipe sizes reflect the sewer line diameters needed to accommodate ultimate flows in the entire Southwest Village Specific Plan area as determined by the "Southwest Village Specific Plan Sewer Study."

Velocities in the proposed gravity sewer lines range from 1.7 up to 7.1 fps. The flow velocity in the proposed trunk sewer line is low because those lines are designed to accommodate future flow from the Southwest Village Specific Plan area. As additional projects develop in the Southwest Village Specific Plan area, the additional sewage flow will increase the velocities in the trunk sewer such that the minimum 2 fps will be achieved.

Southwest Village VTM 1 Project Offsite Sewer Analysis – Otay Mesa Trunk Sewer

The offsite sewer system analysis for the Southwest Village VTM 1 project encompasses the existing 10-inch gravity diameter line in existing Beyer Boulevard west of VTM 1 as well as the Otay Mesa Trunk Sewer to the south of the Beyer Boulevard and Otay Mesa Road intersection. The availability of sewer capacity in the downstream Otay Mesa Trunk Sewer will be addressed in the following paragraphs.

Existing Otay Mesa Trunk Sewer Downstream Capacity. The offsite sewer analysis posits that the build-out of the Southwest Village VTM 1 project will precede the construction of any other large development project not already approved within the Otay Mesa Trunk Sewer Basin. By taking City of San Diego flow monitoring and modeling data for existing flows within the Otay Mesa Trunk Sewer and adding flow from approved projects which have connected or will connect to the Otay Mesa Trunk Sewer since the flow monitoring was performed and adding the Southwest Village VTM 1 project build-out sewer flows, the

analysis determines whether capacity is available within the Otay Mesa Trunk Sewer for the VTM 1 project.

Appendix B contains both the offsite existing and offsite existing plus VTM 1 project flows calculations described above. The baseline data for the existing flows in the Otay Mesa Trunk Sewer is the flow monitoring that was conducted by the City in 2018 from July 2nd to August 29th. Since that time there has been additional development within the Otay Mesa Trunk Sewer area. The additional flow for the 576 units of the Candlelight and Southwind project (Project No. 40329) amount to an additional 161,280 gpd of average dry weather flow. The City approved offsite sewer capacity report for the Candlelight and Southwind project was also sourced for existing flows along the Otay Mesa Trunk Sewer downstream of the Southwest Village project connection. The 2018 flow monitoring data is presented in Appendix C.

The results show that the maximum d/D in the existing Otay Mesa Trunk Sewer south of Beyer Boulevard (where the VTM 1 flow will connect to the Otay Mesa Trunk Sewer) during peak wet weather flow is 0.61 d/D in the existing 18-inch sewer. Upon adding the Southwest Village VTM 1 project flows the maximum d/D is 0.73 in the same segments of 18-inch sewer.

For the existing 12-inch and 15-inch diameter Otay Mesa Trunk Sewer lines, the maximum d/D during peak wet weather flow increases from 0.55 d/D under existing flow to 0.66 d/D when adding VTM 1 flows.

Existing Otay Mesa Trunk Sewer lines 18-inch diameter and larger adhere to City depth criteria with the additional VTM 1 units. However, the additional units cannot be accommodated in 15-inch diameter and smaller sewer lines while still adhering to City depth criteria since existing sewage flow in the Otay Mesa Trunk Sewer exceeds the 0.55 d/D criterion for replacement. Per the OMTS hydraulic modeling data from the City in Appendix C, the criterion for replacement is 0.5 for gravity sewers 15-inch diameter and smaller and is 0.75 for gravity sewers 18-inch diameter and larger. Therefore, there are six existing gravity sewer segments that will require upgrades for VTM 1. These segments are highlighted on Figure 3 and indicated on Exhibit A.

Offsite Sewer Upgrades

The City's anticipated Otay Mesa Trunk Sewer Upgrade Report and corresponding sewer model is expected to identify the ultimate gravity sewer pipe sizes needed for the Otay Mesa Trunk Sewer in order to accommodate ultimate peak wet weather flows for the build-out of the entire South Otay Mesa Sewer Basin. Upgrade of any segment of the Otay Mesa Trunk Sewer should be done to the line sizes determined in the City's South Otay Mesa Trunk Sewer Upgrade Report. A more detailed discussion and analysis of the Otay Mesa Trunk Sewer pipe sizing for the Southwest Village Specific Plan flow is included as part of the "Southwest Village Specific Plan Sewer Study."

Conclusions and Recommendations

The following conclusions and recommendations are summarized based on the sewer system analysis prepared for the proposed Southwest Village VTM 1 development project in the Otay Mesa area of the City of San Diego.

1. The Southwest Village VTM 1 project, consisting of 920 residential dwelling units, will gravity sewer to the existing Otay Mesa Trunk Sewer at Beyer Boulevard and Otay Mesa Road.

2. The Southwest Village VTM 1 project will construct a new 15-inch and 18-inch diameter trunk sewer main along proposed Beyer Boulevard to gravity convey project flows westward. All future development within the Southwest Village Specific Plan area will also convey its wastewater through this new trunk sewer line.

3. Onsite gravity sewer mains within the Southwest Village VTM 1 project are 8-inch diameter except for those reaches that will carry future Southwest Village Specific Plan flows. The onsite sewer lines presented in this study have been sized to accommodate the ultimate Southwest Village Specific Plan flows.

4. There are six segments of existing Otay Mesa Trunk Sewer downstream of the Southwest Village VTM 1 project connection point at Otay Mesa Road that do not

have available capacity for the Southwest Village VTM 1 project. This is based on sewer flow monitoring and modeling as provided by the City as well as an estimation of future sewer flow from approved projects. These six segments will need to be upgraded by VTM 1 and are shown on Figure 3 and Exhibit A.

5. The proposed sewer system within the Southwest Village VTM 1 project will consist of both public and private gravity sewer lines. No public sewer lift stations are needed for the Southwest Village VTM 1 project.

6. Figure 4 provides the recommended public sewer system improvements for the Southwest Village VTM 1 project

7. Phase 1 of VTM 1 is comprised of its first 800 units. Phase 1 is analyzed under a separate study titled "Addendum No. 1 to the Sewer Study for the Southwest Village VTM 1 Project in the City of San Diego, PTS# 614791."

8. New sewer lines shall be designed to meet all requirements of the City of San Diego Public Utilities Department Sewer Design Guide, May 2015, or latest edition. Final design will be reflected on the improvement plans and sewer system calculations to be submitted for review and approval.

If you have any questions regarding the information or conclusions and recommendations presented in this report, please do not hesitate to contact the undersigned.

Dexter Wilson Engineering, Inc.

Steven Henderson, P.E.

SH:AO:ah

Attachments

APPENDIX A

SOUTHWEST VILLAGE
VTM 1 ONSITE SEWER ANALYSIS
CALCULATION SPREADSHEET RESULTS

DATE: 9/8/2023

SEWER STUDY SUMMARY

FOR: Southwest Village VTM 1 Project City of San Diego Proposed Onsite Sewer Collection System and Projected Flows

SHT 1 OF 1

JOB NUMBER: 648-031

BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

TRIBUTARY AREAS (LUs)	FROM	EST. IE (ft)	TO	EST. IE (ft)	EST. LENGTH (ft)	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
							IN-LINE	TOTAL							M.G.D.	C.F.S.							
50% of 14	212	476.0	11	475.1	90	13,040	163.0	163.0	80	13,040	4.000	52,160	1.00	52,160	0.052	0.081	12	1.00	0.010492	0.11000	0.11	0.0470	1.72
	11	475.1	10	471.6	380	0	0.0	163.0	80	13,040	4.000	52,160	1.00	52,160	0.052	0.081	12	0.92	0.010933	0.11000	0.11	0.0470	1.72
	10	471.6	9	468.7	310	0	0.0	163.0	80	13,040	4.000	52,160	1.00	52,160	0.052	0.081	12	0.94	0.010848	0.11000	0.11	0.0470	1.72
	9	468.7	8	466.9	190	0	0.0	163.0	80	13,040	4.000	52,160	1.00	52,160	0.052	0.081	12	0.95	0.010780	0.11000	0.11	0.0470	1.72
	8	466.9	7	463.3	210	0	0.0	163.0	80	13,040	4.000	52,160	1.00	52,160	0.052	0.081	15	1.71	0.004420	0.08750	0.07	0.0242	2.13
	7	463.3	6	461.7	280	0	0.0	988.0	80	79,040	2.514	198,707	1.00	198,707	0.199	0.307	15	0.57	0.029163	0.22500	0.18	0.0961	2.05
	6	461.7	5	460.4	150	0	0.0	988.0	80	79,040	2.514	198,707	1.00	198,707	0.199	0.307	15	0.87	0.023680	0.20000	0.16	0.0811	2.43
50% of 11	5	460.4	12	452.5	160	21,520	269.0	1257.0	80	100,560	2.439	245,266	1.00	245,266	0.245	0.380	15	4.94	0.012246	0.15000	0.12	0.0534	4.55
50% of 12 & 14	116	472.7	114	470.7	230	22,480	281.0	281	80	22,480	3.737	84,000	1.00	84,000	0.084	0.130	8	0.87	0.053424	0.15333	0.23	0.1365	2.14
	114	470.7	112	467.2	340	0	0.0	281	80	22,480	3.737	84,000	1.00	84,000	0.084	0.130	8	1.03	0.049101	0.14667	0.22	0.1281	2.28
50% of 13	112	467.2	108	464.3	300	21,760	272.0	553	80	44,240	2.958	130,840	1.00	130,840	0.131	0.202	8	0.97	0.078923	0.18667	0.28	0.1800	2.53
50% of 13	108	464.3	7	463.3	120	21,760	272.0	825	80	66,000	2.716	179,223	1.00	179,223	0.179	0.277	8	0.83	0.116436	0.23333	0.35	0.2450	2.55
Southwind Project (75 Offsite Units)	SW 1	475.5	SW 2	469.4	295	21,000	262.5	263	80	21,000	3.798	79,765	1.00	79,765	0.080	0.123	8	2.07	0.032898	0.12667	0.19	0.1039	2.67
50% of 8 & 9	SW 2	469.4	18	463.3	210	34,000	425.0	688	80	55,000	2.845	156,498	1.00	156,498	0.156	0.242	8	2.90	0.054458	0.16000	0.24	0.1449	3.76
	20	466.0	18	463.3	250	0	0.0	0.0	80	0	Empty Section												
	18	463.3	17	461.5	170	0	0.0	687.5	80	55,000	2.845	156,498	1.00	156,498	0.156	0.242	15	1.06	0.016873	0.17500	0.14	0.0668	2.32
50% of 8 & 9	17	461.5	16	459.4	200	34,000	425.0	1112.5	80	89,000	2.468	219,643	1.00	219,643	0.220	0.340	15	1.05	0.023781	0.20000	0.16	0.0811	2.68
	16	459.4	15	457.1	195	0	0.0	1112.5	80	89,000	2.468	219,643	1.00	219,643	0.220	0.340	15	1.18	0.022437	0.18750	0.15	0.0739	2.94
10	15	457.1	14	454.8	220	35,360	442.0	1554.5	80	124,360	2.370	294,671	1.00	294,671	0.295	0.456	15	1.05	0.031973	0.22500	0.18	0.0961	3.04
	14	454.8	13	453.0	170	0	0.0	1554.5	80	124,360	2.370	294,671	1.00	294,671	0.295	0.456	15	1.06	0.031771	0.22500	0.18	0.0961	3.04
	13	453.0	12	452.5	40	0	0.0	1554.5	80	124,360	2.370	294,671	1.00	294,671	0.295	0.456	15	1.25	0.029240	0.22500	0.18	0.0961	3.04
	12	452.5	3	449.0	350	0	0.0	2811.5	80	224,920	2.165	487,042	1.00	487,042	0.487	0.754	15	1.00	0.054034	0.30000	0.24	0.1449	3.33
	3	449.0	2	446.3	250	0	0.0	2811.5	80	224,920	2.165	487,042	1.00	487,042	0.487	0.754	15	1.08	0.051994	0.28750	0.23	0.1365	3.53
50% of 11	2	446.3	1	442.4	460	21,520	269.0	3080.5	80	246,440	2.250	554,490	1.00	554,490	0.554	0.858	15	0.85	0.066810	0.32500	0.26	0.1623	3.38
50% of 12	1	442.4	19	440.0	205	9,440	118.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	15	1.17	0.055631	0.30000	0.24	0.1449	3.71
	19	440.0	20	432.5	255	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	15	2.94	0.035098	0.23750	0.19	0.1039	5.17
	20	432.5	21	420.7	275	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	15	4.29	0.029058	0.21250	0.17	0.0885	6.07
	21	420.7	22	411.9	160	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	15	5.50	0.025666	0.20000	0.16	0.0811	6.63
	22	411.9	23	395.9	240	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	6.67	0.014336	0.19500	0.13	0.0600	6.22
	23	395.9	24	370.7	320	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.88	0.013191	0.18000	0.12	0.0534	6.99
	24	370.7	25	347.9	290	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.86	0.013202	0.18000	0.12	0.0534	6.99
	25	347.9	26	324.1	300	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.93	0.013142	0.18000	0.12	0.0534	6.99
	26	324.1	27	293.9	385	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.84	0.013217	0.18000	0.12	0.0534	6.99
	27	293.9	28	274.2	250	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.88	0.013187	0.18000	0.12	0.0534	6.99
	28	274.2	29	254.4	250	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.92	0.013153	0.18000	0.12	0.0534	6.99
	29	254.4	30	234.2	260	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.77	0.013280	0.18000	0.12	0.0534	6.99
	30	234.2	31	214.0	280	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	7.21	0.013782	0.18000	0.12	0.0534	6.99
	31	214.0	Ex. 5	205.5	300	0	0.0	3198.5	80	255,880	2.120	542,555	1.00	542,555	0.543	0.840	18	2.83	0.021991	0.22500	0.15	0.0739	5.05

	255,880		542,555	Min Slope	Max dn/D
				0.57	0.35

Min Vel.
1.72

Max Vel.
6.99

LU = Land Use Area

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

APPENDIX B

SOUTHWEST VILLAGE
VTM 1 OFFSITE SEWER ANALYSIS
CALCULATION SPREADSHEET RESULTS

DATE: 7/14/2022

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. (Existing Flows Only)

JOB NUMBER: 648-031

BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units	Ex. 5	Ex. 4	18,200	227.5	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.07	0.010349	0.09167	0.11	0.0470	3.38
	Ex. 4	Ex. 3	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	4.67	0.010789	0.09167	0.11	0.0470	3.38
	Ex. 3	Ex. 2	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.77	0.009703	0.09167	0.11	0.0470	3.38
	Ex. 2	M36S 25	0	0.0	227.5	80	18,200	3.915	71,253	1.00	71,253	0.071	0.110	10	5.30	0.010120	0.09167	0.11	0.0470	3.38
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential	M36S 25	M36S 116	18,200	227.5	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	3.08	0.264778	0.55000	0.55	0.4430	8.07
	M36S 116	M36S 115	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	3.08	0.264778	0.55000	0.55	0.4430	8.07
	M36S 115	M36S 107	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	5.60	0.196365	0.46000	0.46	0.3527	10.13
	M36S 107	M36S 75	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	12	5.60	0.196365	0.46000	0.46	0.3527	10.13
	M36S 75	M37S 59	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	15	6.20	0.102928	0.41250	0.33	0.2260	10.12
	M37S 59	M37S 63	0	0.0	8390.0	80	671,200	1.860	1,248,700	1.85	2,310,096	2.310	3.574	15	6.00	0.104630	0.41250	0.33	0.2260	10.12
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	9528.2	80	762,256	1.831	1,396,054	1.85	2,582,699	2.583	3.996	18	0.33	0.306738	0.90000	0.60	0.4920	3.61
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	9674.2	80	773,932	1.828	1,414,900	1.85	2,617,564	2.618	4.050	18	0.33	0.310879	0.90000	0.60	0.4920	3.66
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	9768.3	80	781,464	1.826	1,426,830	1.85	2,639,636	2.640	4.084	18	0.33	0.313501	0.91500	0.61	0.5020	3.62
	M37S 67	M37S 95	0	0.0	9768.3	80	781,464	1.826	1,426,830	1.85	2,639,636	2.640	4.084	15	1.15	0.273084	0.70000	0.56	0.4530	5.77
	M37S 95	M37S 104	0	0.0	9768.3	80	781,464	1.826	1,426,830	1.85	2,639,636	2.640	4.084	15	1.15	0.273084	0.70000	0.56	0.4530	5.77
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	13459.8	80	1,076,780	1.774	1,910,096	1.85	3,533,678	3.534	5.468	24	0.65	0.139173	0.76000	0.38	0.2739	4.99
	M37S 93	M37S 120	0	0.0	13459.8	80	1,076,780	1.774	1,910,096	1.85	3,533,678	3.534	5.468	24	0.65	0.139173	0.76000	0.38	0.2739	4.99
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	13459.8	80	1,076,780	1.774	1,910,096	1.85	3,533,678	3.534	5.468	24	0.65	0.139173	0.76000	0.38	0.2739	4.99

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,076,780	13,460	0.33	0.61	3.61	10.12

LU = Land Use Area

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 6/22/2023

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. (Existing Flows plus VTM 1)

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
65 Existing Single-Family Units	Ex. 5	Ex. 4	274,080	3426.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	5.07	0.083802	0.24167	0.29	0.1890	6.80
	Ex. 4	Ex. 3	0	0.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	4.67	0.087361	0.25000	0.30	0.1982	6.49
	Ex. 3	Ex. 2	0	0.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	5.77	0.078571	0.23333	0.28	0.1800	7.14
	Ex. 2	M36S 25	0	0.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	5.30	0.081942	0.24167	0.29	0.1890	6.80
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential + VTM 1 + Southwind	M36S 25	M36S 116	274,080	3426.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	12	3.08	0.353619	0.66000	0.66	0.5500	8.68
	M36S 116	M36S 115	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	12	3.08	0.353619	0.66000	0.66	0.5500	8.68
	M36S 115	M36S 107	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	12	5.60	0.262251	0.54000	0.54	0.4330	11.03
	M36S 107	M36S 75	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	12	5.60	0.262251	0.54000	0.54	0.4330	11.03
	M36S 75	M37S 59	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	15	6.20	0.137464	0.47500	0.38	0.2739	11.15
	M37S 59	M37S 63	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	15	6.00	0.139736	0.47500	0.38	0.2739	11.15
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	12726.7	80	1,018,136	1.784	1,816,019	1.85	3,359,636	3.360	5.198	18	0.33	0.399013	1.08000	0.72	0.6050	3.82
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	12872.7	80	1,029,812	1.782	1,834,841	1.85	3,394,457	3.394	5.252	18	0.33	0.403148	1.09500	0.73	0.6140	3.80
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	12966.8	80	1,037,344	1.780	1,846,959	1.85	3,416,874	3.417	5.287	18	0.33	0.405811	1.09500	0.73	0.6140	3.83
	M37S 67	M37S 95	0	0.0	12966.8	80	1,037,344	1.780	1,846,959	1.85	3,416,874	3.417	5.287	15	1.15	0.353493	0.82500	0.66	0.5500	6.15
	M37S 95	M37S 104	0	0.0	12966.8	80	1,037,344	1.780	1,846,959	1.85	3,416,874	3.417	5.287	15	1.15	0.353493	0.82500	0.66	0.5500	6.15
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	16658.3	80	1,332,660	1.731	2,306,335	1.85	4,266,719	4.267	6.602	24	0.65	0.168044	0.84000	0.42	0.3130	5.27
	M37S 93	M37S 120	0	0.0	16658.3	80	1,332,660	1.731	2,306,335	1.85	4,266,719	4.267	6.602	24	0.65	0.168044	0.84000	0.42	0.3130	5.27
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	16658.3	80	1,332,660	1.731	2,306,335	1.85	4,266,719	4.267	6.602	24	0.65	0.168044	0.84000	0.42	0.3130	5.27

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,332,660	16,658	0.33	0.73	3.82	11.15

LU = Land Use Area

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

DATE: 9/8/2023

SEWER STUDY SUMMARY

FOR: Southwest Village Project City of San Diego Offsite Analysis in Beyer Blvd. (Existing Flows plus VTM 1, with Upgrades)

JOB NUMBER: 648-031 BY: Dexter Wilson Engineering, Inc.

REFER TO PLAN SHEET: Exhibit A

REMARKS (TRIBUTARY AREAS)	FROM	TO	IN-LINE FLOW (gpd)	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAK DWF FACTOR	PEAK DWF (gpd)	PEAK WWF FACTOR	PEAK WWF (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	EST. SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D (2)	C_a for Velocity (3)	VELOCITY (f.p.s.)
				IN-LINE	TOTAL							M.G.D.	C.F.S.							
Ex. Residential + VTM 1 + Southwind	Ex. 5	Ex. 4	274,080	3426.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	5.07	0.083802	0.24167	0.29	0.1890	6.80
	Ex. 4	Ex. 3	0	0.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	4.67	0.087361	0.25000	0.30	0.1982	6.49
	Ex. 3	Ex. 2	0	0.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	5.77	0.078571	0.23333	0.28	0.1800	7.14
	Ex. 2	M36S 25	0	0.0	3426.0	80	274,080	2.105	576,957	1.00	576,957	0.577	0.893	10	5.30	0.081942	0.24167	0.29	0.1890	6.80
OMTS*	M36S 20	M36S 25	653,000	8162.5	8162.5	80	653,000	1.868	1,219,793	1.85	2,256,617	2.257	3.492	12	2.00	0.320975	0.62000	0.62	0.5120	6.82
Ex. Residential + VTM 1 + Southwind	M36S 25	M36S 116	274,080	3426.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	27	0.60	0.092168	0.69750	0.31	0.2074	4.55
	M36S 116	M36S 115	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	27	0.60	0.092168	0.69750	0.31	0.2074	4.55
	M36S 115	M36S 107	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	27	5.60	0.030169	0.40500	0.18	0.0961	9.81
	M36S 107	M36S 75	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	27	5.60	0.030169	0.40500	0.18	0.0961	9.81
	M36S 75	M37S 59	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	15	6.20	0.137464	0.47500	0.38	0.2739	11.15
	M37S 59	M37S 63	0	0.0	11588.5	80	927,080	1.799	1,667,675	1.85	3,085,198	3.085	4.774	15	6.00	0.139736	0.47500	0.38	0.2739	11.15
325.2 Ex. EDUs	M37S 63	M37S 69	91,056	1138.2	12726.7	80	1,018,136	1.784	1,816,019	1.85	3,359,636	3.360	5.198	18	0.33	0.399013	1.08000	0.72	0.6050	3.82
41.7 Ex. EDUs	M37S 69	M37S 66	11,676	146.0	12872.7	80	1,029,812	1.782	1,834,841	1.85	3,394,457	3.394	5.252	18	0.33	0.403148	1.09500	0.73	0.6140	3.80
26.9 Ex. EDUs	M37S 66	M37S 67	7,532	94.2	12966.8	80	1,037,344	1.780	1,846,959	1.85	3,416,874	3.417	5.287	18	0.33	0.405811	1.09500	0.73	0.6140	3.83
	M37S 67	M37S 95	0	0.0	12966.8	80	1,037,344	1.780	1,846,959	1.85	3,416,874	3.417	5.287	33	3.90	0.023446	0.44000	0.16	0.0811	8.62
	M37S 95	M37S 104	0	0.0	12966.8	80	1,037,344	1.780	1,846,959	1.85	3,416,874	3.417	5.287	33	1.00	0.046302	0.60500	0.22	0.1281	5.46
1,054.7 Ex. EDUs	M37S 104	M37S 93	295,316	3691.5	16658.3	80	1,332,660	1.731	2,306,335	1.85	4,266,719	4.267	6.602	24	0.65	0.168044	0.84000	0.42	0.3130	5.27
	M37S 93	M37S 120	0	0.0	16658.3	80	1,332,660	1.731	2,306,335	1.85	4,266,719	4.267	6.602	24	0.65	0.168044	0.84000	0.42	0.3130	5.27
Junction with Ex. 27"	M37S 120	M37S 117	0	0.0	16658.3	80	1,332,660	1.731	2,306,335	1.85	4,266,719	4.267	6.602	24	0.65	0.168044	0.84000	0.42	0.3130	5.27

Total Flow	Total Pop.	Min Slope	Max dn/D	Min Vel.	Max Vel.
1,332,660	16,658	0.33	0.73	3.82	11.15

LU = Land Use Area

* OMTS tributary area sewer flow based on flow monitoring and modeling performed by the City (520,000 gpd) in addition to the calaculated sewer flow from the Candlelight project (475 units, 133,000 gpd)

1 K' based on n = 0.013
2 dn/D using K' in Brater King Table 7-14
3 From Brater King Table 7-4 based on dn/D

LEGEND

- PROJECT BOUNDARY
- EXISTING PUBLIC SEWER
- PROPOSED PUBLIC SEWER
- PROPOSED PRIVATE SEWER
- (1) COMPUTER MODEL MANHOLE NUMBER

N

0 600 FEET

OTAY MESA RD

CALIENTE AVE

SOUTHWIND PROJECT

CENTRAL AVE

SEWER STUB TO SOUTHWIND PROJECT

PROPOSED CALIENTE AVE

WEST AVE

BEYER BLVD

PROPOSED BEYER BLVD

PA-8

PA-9

PA-10

PA-11

PA-12

PA-13

PA-14

M36S-20

M36S-25

M36S-116

M36S-115

M36S-107

M36S-75

M37S-59

M37S-63

M37S-66

M37S-69

M37S-67

M37S-93

M37S-95

M37S-104

M37S-120

M37S-117

EX.10"

EX.12"

EX.15"

EX.18"

EX.24"

EX.27"

EX.2

EX.3

EX.4

EX.5

INTERSTATE CALIFORNIA 805

INTERSTATE CALIFORNIA 5

MANHOLE INFORMATION			
NO.	RIM	INVERT	DEPTH
SW 2	484.7	475.5	9.2
SW 1	477.7	469.4	8.3
116	490.4	472.7	17.7
114	488.4	470.7	17.7
112	485	467.2	17.8
108	482.1	464.3	17.8
212	494.9	476.0	18.9
11	495.4	475.1	20.3
10	494.3	471.6	22.7
9	489.5	468.7	20.8
8	486.1	466.9	19.2
7	482.2	463.3	18.9
6	475.1	461.7	13.4
5	471.2	460.4	10.8
20	481.27	466.0	15.27
18	478.71	463.3	15.4
17	476.98	461.5	15.5
16	474.96	459.4	15.6
15	472.69	457.1	15.59
14	470.42	454.8	15.62
13	468.9	453.0	15.89
12	468.8	452.5	16.3
3	465.3	449	16.3
2	462.6	446.3	16.3
1	455.7	442.4	13.3
19	451.6	440.0	11.6
20	444.1	432.5	11.6
21	432.3	420.7	11.6
22	423.5	411.9	11.6
23	407.5	395.9	11.6
24	382.3	370.7	11.6
25	359.5	347.9	11.6
26	335.7	324.1	11.6
27	305.5	293.9	11.6
28	285.8	274.2	11.6
29	266.0	254.4	11.6
30	245.8	234.2	11.6
31	225.6	214.0	11.6

PIPE INFORMATION				
FROM	TO	SIZE	SLOPE	LENGTH
SW 2	SW 1	8	2.07%	295
SW 1	18	8	2.90%	210
116	114	8	0.87%	230
114	112	8	1.03%	340
112	108	8	0.97%	300
108	7	8	0.83%	120
212	11	12	1.00%	90
11	10	12	0.92%	380
10	9	12	0.94%	310
9	8	12	0.95%	190
8	7	12	1.71%	210
7	6	15	0.57%	280
6	5	15	0.87%	150
5	12	15	4.94%	160
20	18	12	1.08%	250
18	17	12	1.06%	170
17	16	15	1.05%	200
16	15		1.18%	195
15	14	15	1.05%	220
14	13	15	1.06%	170
13	12	15	1.25%	40
12	3	15	1.00%	350
3	2	15	1.08%	250
2	1	15	0.85%	460
1	19	15	1.17%	205
19	20	15	2.94%	255
20	21	15	4.29%	275
21	22	15	5.50%	160
22	23	18	6.67%	240
23	24	18	7.88%	320
24	25	18	7.86%	290
25	26	18	7.93%	300
26	27	18	7.84%	385
27	28	18	7.88%	250
28	29	18	7.92%	250
29	30	18	7.77%	260
30	31	18	7.21%	280
31	Ex. 5	18	2.83%	300

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

EXHIBIT A

SEWER MANHOLE NUMBER DIAGRAM

SOUTHWEST VILLAGE VTM1

APPENDIX C

CITY OF SAN DIEGO 2018 FLOW MONITORING RESULTS FOR THE OTAY MESA TRUNK SEWER

DRAFT

CITY OF SAN DIEGO
FLOW CALCULATION TABLE
TS93B WEST OTAY MESA
2018 WWF - BASEFLOW + SOUTHWEST DEVELOPMENT 788 DU (No I&I)

EXISTING CONDITION

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
5624494	N36S23.1	N36SP2	513.50	511.59	539.70	0.005	18	359	3.0	4.36	24.2	0.637	4.96	12.8
5624494	N36SP2.1	N35SP1	511.59	508.09	538.06	0.005	18	676	3.0	4.39	24.4	0.637	4.89	13.0
5624494	N35SP1.1	N35S147	508.09	485.89	520.00	0.040	18	559	6.1	2.66	14.8	0.637	13.53	4.7
5625234	N35S147.1	N35S153	485.74	484.39	519.00	0.006	42	218	2.8	3.29	7.8	0.637	51.18	1.2
5625237	N35S153.1	N35S154	484.39	480.13	507.00	0.006	42	747	2.7	3.35	8.0	0.637	49.11	1.3
5625239	N35S154.1	N35S152	480.13	478.65	503.60	0.006	42	243	2.8	3.30	7.9	0.637	50.75	1.3
5625242	N35S152.1	N36S24	478.65	477.13	496.30	0.006	42	252	2.8	3.31	7.9	0.637	50.51	1.3
5625244	N36S24.1	N36S25	477.13	469.50	480.90	0.018	42	423	4.1	2.55	6.1	0.637	87.34	0.7
5625246	N36S25.1	N36S26	469.50	458.95	470.90	0.064	42	165	7.6	2.48	5.9	1.125	164.44	0.7
5625249	N36S26.1	N36S27	458.95	450.50	462.30	0.058	42	145	7.3	2.53	6.0	1.125	156.99	0.7
5625248	N36S27.1	N36S28	450.50	436.00	449.80	0.059	42	245	7.4	2.53	6.0	1.125	158.21	0.7
5625252	N36S28.1	N36S34	436.00	431.65	446.20	0.057	42	76	7.3	2.55	6.1	1.125	155.58	0.7
5625254	N36S34.1	N36S32	431.65	430.74	446.20	0.018	42	50	4.9	3.33	7.9	1.125	87.73	1.3
00000	N36S32.1	N36S33	430.74	430.25	445.40	0.031	42	16	5.9	2.95	7.0	1.125	113.81	1.0
00000	N36S33.1	N36S30	430.25	429.63	444.60	0.031	42	20	5.9	2.94	7.0	1.125	114.50	1.0
00000	N36S30.1	N36S31	429.63	418.63	434.50	0.058	42	191	7.3	2.54	6.1	1.125	156.02	0.7
00000	N36S31.1	M36S189	418.63	398.88	418.20	0.056	42	355	7.2	2.56	6.1	1.125	153.37	0.7
00000	M36S189.1	M36S190	398.88	385.88	400.60	0.056	42	234	7.2	2.56	6.1	1.125	153.33	0.7
00000	M36S190.1	M36S191	385.88	384.68	399.20	0.038	42	31	6.3	2.79	6.7	1.125	127.54	0.9
00000	M36S191.1	M36S192	384.68	383.38	397.90	0.048	42	27	6.9	2.65	6.3	1.125	142.72	0.8
00000	M36S192.1	M36S193	383.38	358.73	371.40	0.049	42	500	6.9	2.64	6.3	1.125	144.38	0.8
00000	M36S193.1	M36S195	358.73	356.38	369.00	0.050	42	47	6.9	2.63	6.3	1.125	144.85	0.8
00000	M36S195.1	M36S194	356.38	353.98	366.70	0.051	42	47	7.0	2.61	6.2	1.125	146.95	0.8
00000	M36S194.1	M36S203	353.98	346.38	358.80	0.056	42	136	7.2	2.56	6.1	1.125	153.90	0.7
00000	M36S203.1	M36S204	346.38	312.63	324.30	0.054	42	630	7.1	2.58	6.2	1.125	150.55	0.7
00000	M36S204.1	M36S196	312.63	295.88	307.60	0.068	42	247	7.7	2.44	5.8	1.125	169.54	0.7
00000	M36S196.1	M36S197	295.88	276.35	290.50	0.034	42	579	6.1	2.88	6.9	1.125	119.43	0.9
00000	M36S197.1	M36S202	276.35	242.38	254.60	0.035	42	980	6.1	2.86	6.8	1.125	121.10	0.9
00000	M36S202.1	M36S198	242.38	238.73	254.60	0.007	42	522	3.5	4.18	10.0	1.125	54.41	2.1
00000	M36S198.1	M36S201	238.73	237.53	253.20	0.012	42	98	4.2	3.66	8.7	1.125	71.85	1.6
00000	M36S201.1	M36S200	237.53	229.65	247.70	0.046	42	170	6.8	2.67	6.4	1.125	139.93	0.8
00000	M36S200.1	M36S199B	229.65	229.45	247.00	0.020	24	10	5.4	3.80	15.8	1.125	16.89	6.7
00000	M36S199B.1	M36S199A	229.45	227.00	237.00	0.012	24	197	5.4	5.50	22.9	1.881	16.14	11.7

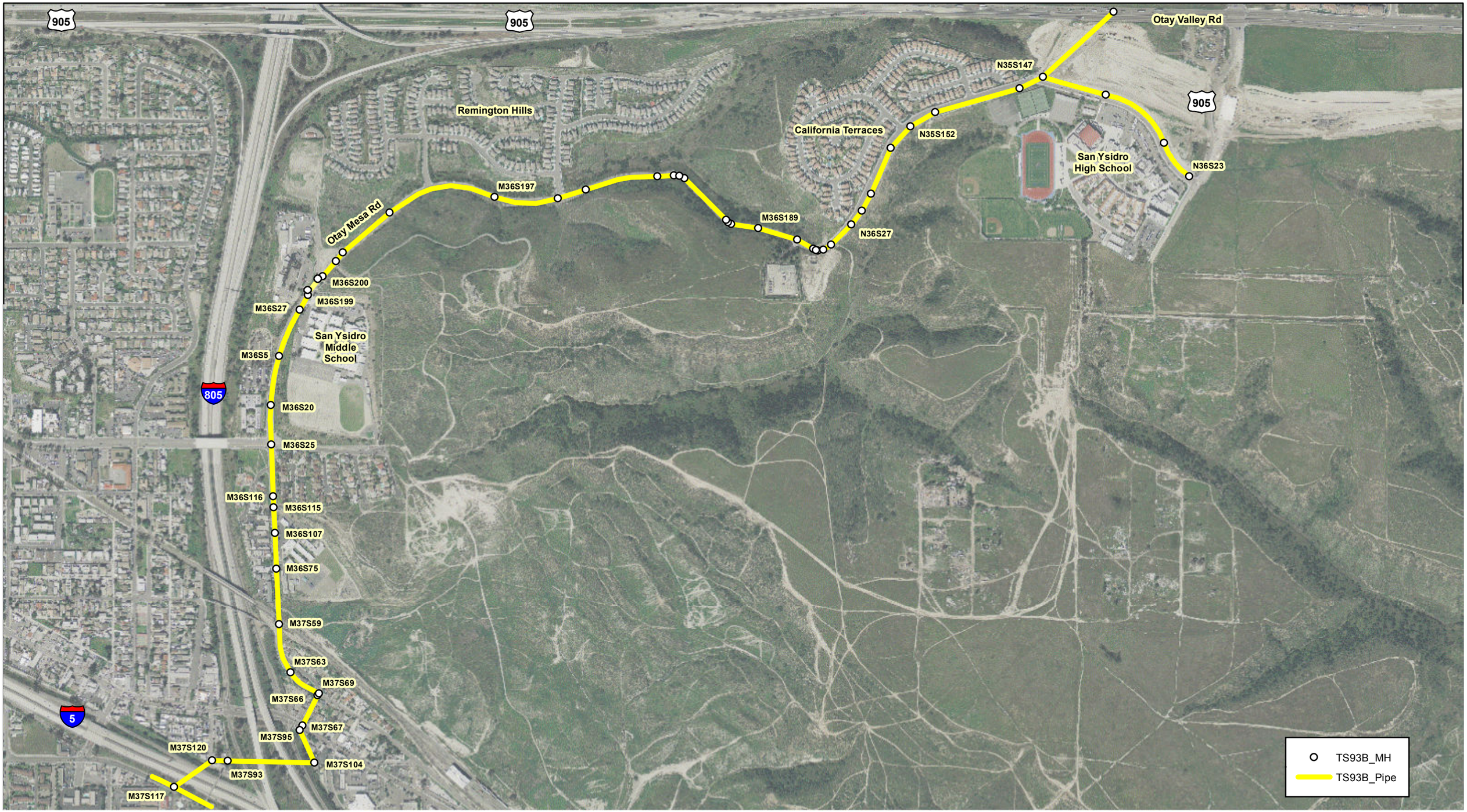
DRAFT

CITY OF SAN DIEGO
FLOW CALCULATION TABLE
TS93B WEST OTAY MESA
2018 WWF - BASEFLOW + SOUTHWEST DEVELOPMENT 788 DU (No I&I)

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
00000	M36S199A.1	M36S199	227.00	226.80	236.85	0.033	24	6	7.6	4.31	18.0	1.881	25.33	7.4
00000	M36S199.1	M36S27	226.80	216.99	225.99	0.069	10	143	10.6	5.04	50.4	1.881	3.16	59.5
64843	M36S27.1	M36S5	216.99	185.49	195.49	0.070	10	450	10.6	5.01	50.1	1.881	3.75	50.1
64846	M36S5.1	M36S20	185.49	157.96	167.96	0.070	10	393	10.6	5.01	50.1	1.881	3.75	50.1
64855	M36S20.1	M36S25	157.96	150.96	162.47	0.020	12	350	6.6	6.54	54.5	1.881	3.26	57.7
64858	M36S25.1	M36S116	150.47	137.38	146.38	0.031	12	425	8.2	6.52	54.3	2.319	4.04	57.4
64791	M36S116.1	M36S115	137.38	131.40	135.36	0.062	12	97	10.7	5.32	44.3	2.319	5.72	40.5
64834	M36S115.1	M36S107	131.40	119.18	127.18	0.054	12	228	10.2	5.56	46.3	2.337	5.33	43.8
64835	M36S107.1	M36S75	119.18	102.00	108.00	0.056	12	307	10.3	5.49	45.8	2.337	5.45	42.9
64832	M36S75.1	M37S59	102.00	74.00	80.00	0.062	15	450	10.6	4.83	32.2	2.337	10.42	22.4
64984	M37S59.1	M37S63	74.00	46.72	55.72	0.061	15	450	10.5	4.86	32.4	2.337	10.28	22.7
64985	M37S63.1	M37S69	46.72	45.72	51.76	0.003	18	306	3.6	10.07	55.9	2.337	3.88	60.2
64992	M37S69.1	M37S66	45.72	45.65	51.65	0.003	18	22	3.6	11.21	62.3	2.720	3.83	71.0
64980	M37S66.1	M37S67	45.65	45.15	52.73	0.002	18	283	2.8	14.17	78.7	2.745	2.85	96.3
64981	M37S67.1	M37S95	45.15	44.56	52.56	0.011	15	53	5.9	8.60	57.3	2.760	4.41	62.6
64973	M37S95.1	M37S104	44.56	41.27	52.04	0.012	15	278	6.0	8.44	56.3	2.760	4.54	60.8
64996	M37S104.1	M37S93	40.04	35.38	50.38	0.006	24	720	4.9	8.40	35.0	3.095	11.77	26.3
64929	M37S93.1	M37S120	35.38	34.51	50.51	0.006	24	135	4.9	8.41	35.1	3.095	11.74	26.4
64928	M37S120.1	M37S117	34.51	31.76	47.76	0.007	24	386	5.1	8.30	34.6	3.171	12.34	25.7

* Southwest: 788 DU or 675 EDU - 0.189 mgd average daily flow, Peak at 0.421 mgd (@Byer, Manole M36S25)

* flow exceeds sewer design guides criteria



West Otay Mesa TS (TS 93B)

Project Model

N

1 inch = 750 feet

DRAFT

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
West Otay Mesa Trunk Sewer - Ultimate Pipe Sizing
2050 WWF with Flow Diversion From Sewer Pump Station 23T

ULTIMATE CONDITION

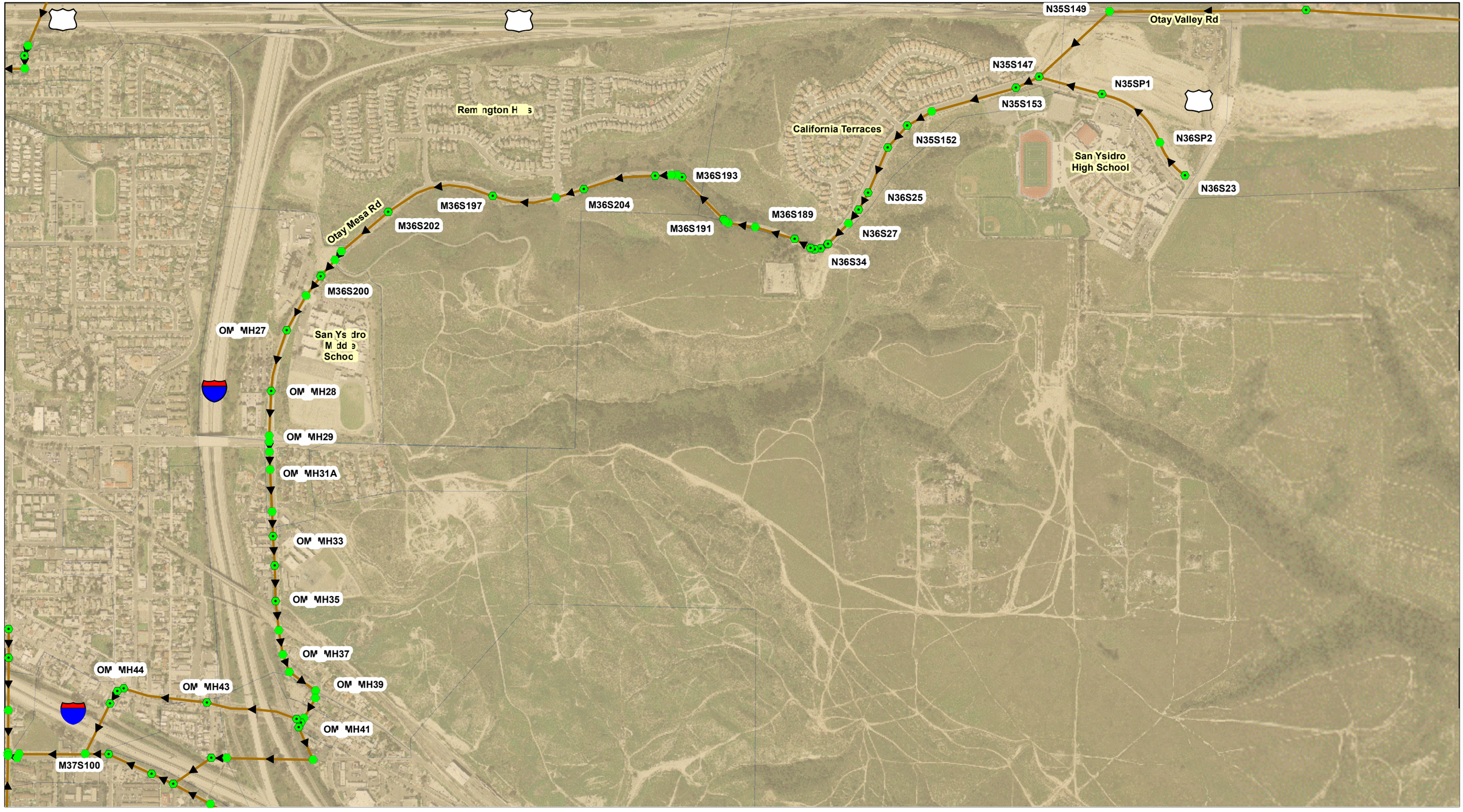
FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
5625234	N35S147.1	N35S153	485.74	484.39	519.00	0.006	42	218	6.19	13.39	31.9	485.51	486.10	33.49	10.557	51.18	20.6
5625237	N35S153.1	N35S154	484.39	480.13	507.00	0.006	42	747	6.19	13.38	31.9	481.25	481.84	25.76	10.557	49.11	21.5
5625239	N35S154.1	N35S152	480.13	478.65	503.60	0.006	42	243	6.31	13.20	31.4	479.75	480.37	23.85	10.557	50.75	20.8
5625242	N35S152.1	N36S24	478.65	477.13	496.30	0.006	42	252	6.32	13.19	31.4	478.23	478.85	18.07	10.557	50.51	20.9
5625244	N36S24.1	N36S25	477.13	469.50	480.90	0.018	42	423	8.47	10.68	25.4	470.39	471.51	10.51	10.557	87.34	12.1
5625246	N36S25.1	N36S26	469.50	458.95	470.90	0.064	42	165	11.89	8.50	20.2	459.66	461.85	11.24	10.706	164.44	6.5
5625249	N36S26.1	N36S27	458.95	450.50	462.30	0.058	42	145	11.94	8.47	20.2	451.21	453.42	11.09	10.706	156.99	6.8
5625248	N36S27.1	N36S28	450.50	436.00	449.80	0.059	42	245	11.83	8.53	20.3	436.71	438.89	13.09	10.706	158.21	6.8
5625252	N36S28.1	N36S34	436.00	431.65	446.20	0.057	42	76	8.53	10.74	25.6	432.55	433.67	13.66	10.706	155.58	6.9
5625254	N36S34.1	N36S32	431.65	430.74	446.20	0.018	42	50	8.54	10.73	25.5	431.63	432.77	14.57	10.706	87.73	12.2
	N36S32.1	N36S33	430.74	430.25	445.40	0.031	42	16	9.97	9.61	22.9	431.05	432.60	14.35	10.706	113.81	9.4
	N36S33.1	N36S30	430.25	429.63	444.60	0.031	42	20	10.01	9.59	22.8	430.43	431.99	14.17	10.706	114.50	9.3
	N36S30.1	N36S31	429.63	418.63	434.50	0.058	42	191	11.74	8.58	20.4	419.35	421.49	15.16	10.706	156.02	6.9
	N36S31.1	M36S189	418.63	398.88	418.20	0.056	42	355	11.74	8.58	20.4	399.60	401.74	18.61	10.706	153.37	7.0
	M36S189.1	M36S190	398.88	385.88	400.60	0.056	42	234	10.61	9.20	21.9	386.65	388.40	13.95	10.706	153.33	7.0
	M36S190.1	M36S191	385.88	384.68	399.20	0.038	42	31	10.65	9.18	21.9	385.45	387.21	13.76	10.706	127.54	8.4
	M36S191.1	M36S192	384.68	383.38	397.90	0.048	42	27	11.34	8.78	20.9	384.11	386.11	13.79	10.706	142.72	7.5
	M36S192.1	M36S193	383.38	358.73	371.40	0.049	42	500	11.38	8.76	20.9	359.46	361.47	11.94	10.706	144.38	7.4
	M36S193.1	M36S195	358.73	356.38	369.00	0.050	42	47	11.43	8.74	20.8	357.11	359.14	11.89	10.706	144.85	7.4
	M36S195.1	M36S194	356.38	353.98	366.70	0.051	42	47	11.52	8.69	20.7	354.70	356.77	12.00	10.706	146.95	7.3
	M36S194.1	M36S203	353.98	346.38	358.80	0.056	42	136	11.62	8.64	20.6	347.10	349.20	11.70	10.706	153.90	7.0
	M36S203.1	M36S204	346.38	312.63	324.30	0.054	42	630	11.68	8.60	20.5	313.35	315.47	10.95	10.706	150.55	7.1
	M36S204.1	M36S196	312.63	295.88	307.60	0.068	42	247	10.22	9.46	22.5	296.67	298.29	10.93	10.706	169.54	6.3
	M36S196.1	M36S197	295.88	276.35	290.50	0.034	42	579	10.26	9.43	22.5	277.14	278.77	13.36	10.706	119.43	9.0
	M36S197.1	M36S202	276.35	242.38	254.60	0.035	42	980	6.56	12.96	30.9	243.46	244.13	11.14	10.706	121.10	8.8
	M36S202.1	M36S198	242.38	238.73	254.60	0.007	42	522	6.73	12.96	30.9	239.81	240.51	14.79	10.977	54.41	20.2
	M36S198.1	M36S201	238.73	237.53	253.20	0.012	42	98	7.62	11.84	28.2	238.52	239.42	14.68	10.977	71.85	15.3
	M36S201.1	M36S200	237.53	231.36	247.70	0.036	42	170	7.43	12.06	28.7	232.37	233.22	15.34	10.977	123.82	8.9
	M36S200.1	OM_MH25	231.36	229.77	247.70	0.010	42	166	6.25	13.87	33.0	230.93	231.53	16.77	11.028	63.65	17.3
	OM_MH25.1	OM_MH26	229.65	227.50	238.90	0.012	24	180	8.29	14.95	62.3	228.75	229.81	10.15	11.028	15.98	69.0
	OM_MH26.1	OM_MH27	227.50	202.25	214.80	0.070	24	360	15.61	9.11	38.0	203.01	206.80	11.79	11.028	38.73	28.5
	OM_MH27.1	OM_MH28	202.25	156.90	168.80	0.067	27	675	10.36	11.68	43.2	157.87	159.54	10.93	11.028	51.89	21.3
	OM_MH28.1	OM_MH29	156.90	151.40	162.18	0.023	27	242	5.64	19.62	72.7	153.04	153.53	9.15	11.028	30.18	36.5
Beyer Bl	OM_MH29.1	OM_MH30	151.40	151.10	162.22	0.006	27	50	6.60	19.36	71.7	152.71	153.39	9.51	13.012	15.51	83.9
	OM_MH30.1	OM_MH31	151.10	150.40	162.29	0.006	27	116	6.77	18.90	70.0	151.98	152.69	10.32	13.011	15.55	83.7
	OM_MH31.1	OM_MH31A	150.10	146.38	160.00	0.019	27	198	10.20	13.43	49.7	147.50	149.12	12.50	13.022	27.44	47.5
	OM_MH31A.1	OM_MH32	142.38	127.45	139.30	0.051	27	290	14.50	10.27	38.0	128.31	131.57	10.99	13.022	45.42	28.7
	OM_MH32.1	OM_MH33	127.45	107.25	125.70	0.064	27	314	15.27	9.90	36.7	108.08	111.70	17.63	13.029	50.78	25.7
	OM_MH33.1	OM_MH34	107.25	78.85	106.60	0.061	27	464	15.37	9.84	36.4	79.67	83.34	26.93	13.029	49.53	26.3
	OM_MH34.1	OM_MH35	78.58	61.30	92.30	0.055	27	312	14.45	10.31	38.2	62.16	65.40	30.14	13.029	47.11	27.7
	OM_MH35.1	OM_MH36	61.30	53.25	80.00	0.053	27	151	13.91	10.72	39.7	54.14	57.15	25.86	13.219	46.22	28.6

DRAFT

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
West Otay Mesa Trunk Sewer - Ultimate Pipe Sizing
2050 WWF with Flow Diversion From Sewer Pump Station 23T

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
	OM_MH36.1	OM_MH37	53.25	46.50	72.80	0.046	27	148	13.98	10.68	39.6	47.39	50.43	25.41	13.219	42.75	30.9
	OM_MH37.1	OM_MH38	46.50	43.25	58.00	0.039	33	84	8.10	14.54	44.1	44.46	45.48	13.54	13.219	67.24	19.7
	OM_MH38.1	OM_MH39	43.25	41.35	52.40	0.010	33	197	7.20	15.94	48.3	42.68	43.48	9.72	13.218	33.57	39.4
	OM_MH39.1	OM_MH40	41.35	40.77	52.80	0.010	33	59	5.87	18.76	56.8	42.33	42.87	10.47	13.218	33.89	39.0
	OM_MH40.1	OM_MH41	40.77	39.77	52.00	0.004	33	252	6.18	17.98	54.5	41.27	41.86	10.73	13.219	21.53	61.4
								Start of By-Pass (New Line)									
	OM_MH41.1	OM_MH42	39.77	39.36	50.00	0.008	33	53	5.71	19.18	58.1	40.96	41.47	9.04	13.218	30.07	44.0
	OM_MH42.1	OM_MH43	39.36	36.46	50.00	0.004	33	767	5.72	19.15	58.0	38.06	38.56	11.94	13.209	21.02	62.8
	OM_MH43.1	OM_MH44	36.46	33.66	50.00	0.004	33	739	6.18	17.96	54.4	35.16	35.75	14.84	13.205	21.04	62.8
	OM_MH44.1	OM_MH45	33.66	33.23	48.00	0.008	33	53	6.86	16.55	50.1	34.61	35.34	13.39	13.204	30.79	42.9
	OM_MH45.1	OM_MH46	33.23	32.45	47.00	0.006	33	125	6.59	17.08	51.7	33.87	34.55	13.13	13.204	27.00	48.9
	OM_MH46.1	M37S100	32.45	29.95	48.70	0.005	33	457	6.21	18.19	55.1	31.47	32.06	17.23	13.197	25.28	52.2

TOTAL LENGTH (MILES):	2.62	LENGTH OF PIPE - d/D < 50% (MILES):	2.04	LENGTH OF PIPE - Q/CAP < 50% (MILES):	2.14
LENGTH WEIGHTED Q/CAP:	26.0	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.59	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.45
LENGTH WEIGHTED d/D:	36.5	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.03
LENGTH WEIGHTED HGL BELOW RIM (FT):	15.21	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00



West Otay Mesa TS (TS 93B)

Project Model

TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Node
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Conduit
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Subcatchment

1 inch = 750 feet

N

West Otay Mesa TS (TS 93B)

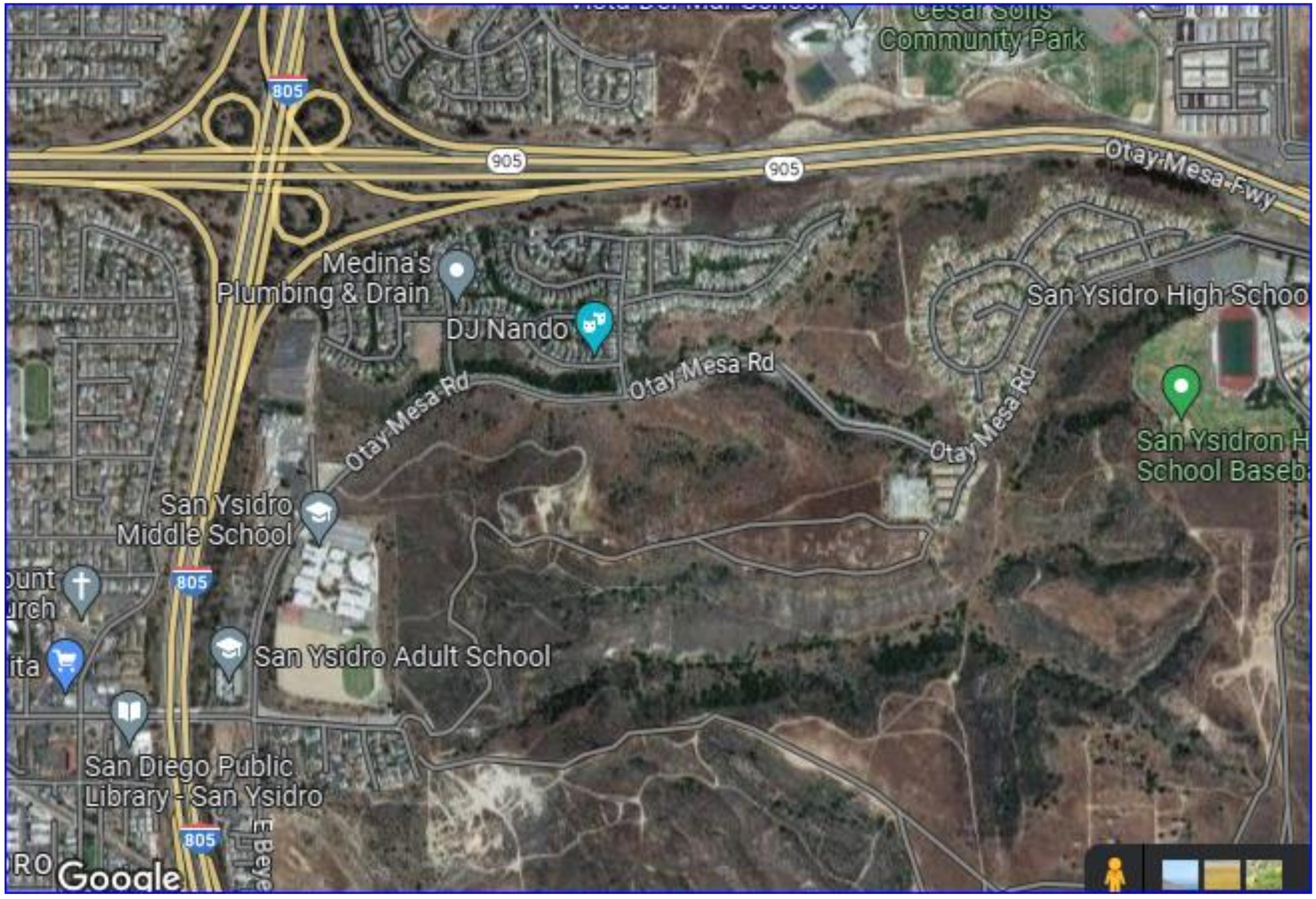
Project Model

TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Node
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Conduit
TS93_2050_WWF_Ph2B1___CPU_Contractual_Cnty_Subcatchment

N

1 inch = 505 feet

West Otay Mesa Trunk Sewer – Location Map



ALIGNMENT ALONG OTAY MESA RD.

street alignments) and all potential points of entry of sewage from surrounding lands.

1.3.1.3 Depth of Mains

The planning study shall clearly identify all existing and/or proposed facilities which will exceed standard depths for sewer mains as defined in Subsection 2.2.1.5. In cases where proposed sewers will exceed 15 feet in depth, a request for design deviation (ATTACHMENT 2) must be submitted to the Water and Sewer Development Review Senior Civil Engineer with the Sewer Planning Study. A design deviation will only be approved in exceptional cases and when adequate justification is provided. Mains more than 20 feet deep shall also require approval from the Wastewater Collection Division Senior Civil Engineer.

1.3.1.4 Existing Studies

The City of San Diego maintains an extensive library of sewer planning studies which were prepared for lands throughout the City. These studies are available for review at the Water and Sewer Development Section, Public Utilities Department. All studies are catalogued by subdivision or trunk sewer name. Logs of sewer flow study analyses for recently monitored trunk sewers and a map of sewers which meet the Regional Water Quality Control Board (RWQCB) criteria for being critical or sub-critical may also be viewed. In addition, information regarding proposed CIP projects within the vicinity of a given project may be requested. In many cases, an addendum or reference to one of the existing planning studies may be acceptable in lieu of an independent study. Concurrent with the preparation of planning studies for sewers proposed to connect to existing canyon sewer mains, a study of flow redirection per Council Policy 400-13 and a cost-benefit analysis per Council Policy 400-14 shall be prepared (Refer to ATTACHMENT 1). An existing analysis of redirection of flows and a cost-benefit analysis, as required by Council Policies 400-13 and 400-14 respectively, may be available for reference for various existing canyon sewers.

1.3.2 Flow Estimation

1.3.2.1 Land Use

Present or future allowable land use, whichever results in higher equivalent population, shall be used to generate potential sewage flows.

1.3.2.2 Flow Determination

Flow definitions and calculation procedures are listed below. All calculations shall be tabulated for each sewer main section (manhole to manhole) in the

format shown on Figure 1-2.

Equivalent Population: The equivalent population shall be calculated from zoning information (Ref. Section 1.6). For major new facilities such as high rise apartment buildings, flow rates (assuming one lateral) shall be checked based on the most current, adopted edition of the Uniform Plumbing Code. The most conservative flow rate shall govern.

Daily Per Capita Sewer Flow: The sewer flow for the equivalent population shall be 80 gallons per capita per day (gpcd).

Average Dry Weather Flow (ADWF): Equivalent populations shall be used to calculate the average dry weather flow. The average dry weather flow for each sewer main reach (manhole to manhole) shall be determined by multiplying the total accumulated equivalent population contributing to that reach by 80 gallons per capita per day:

Average Dry Weather Flow = (80 gpcpd) x (Equivalent Population)

Peaking Factor for Dry Weather Flow (PFDWF): The peaking factor is the ratio of peak dry weather flow to average dry weather flow. It is dependent upon the equivalent population within a tributary area. The tributary area is the area upstream of, and including, the current reach for the total flow in each reach of pipe. Figure 1-1, consisting of the table prepared by Holmes and Narver in 1960, shall be used to determine peaking factors for each tributary area. In no instance shall the dry weather flow peaking factor be less than 1.5.

Peak Dry Weather Flow (PDWF): The peak dry weather flow for each sewer main reach shall be determined by multiplying the average dry weather flow by the appropriate peaking factor (Note that peak dry weather flows are not algebraically cumulative as routed through the sewer system, i.e. the peak dry weather flow at any point shall be based on the equivalent population in the basin to that point (Ref. Figure 1-2).

Peak Dry Weather Flow = (Average Dry Weather Flow) x (Dry Weather Flow Peaking Factor)

Peaking Factor for Wet Weather Flow (PFWWF): The peaking factor for wet weather flow is the ratio of peak wet weather flow to peak dry weather flow. It is basin-specific and shall be based on essential information available at the time of the planning study. Information such as historical rainfall/sewage flow data, land use, soil data, pipe/manhole age, materials and conditions, groundwater elevations (post development), inflow and infiltration (I/I) studies, size, slope and densities of the drainage basin, etc., should be utilized in the wet weather analysis to estimate the peaking factor for wet weather. Upward adjustments shall be made in areas with expected high inflow and

infiltration (i.e. high ground water or in areas with lush landscaping schemes). Flow meters are installed throughout the City's sewer system. Flow data collected from these meters are available upon request. The objective of this analysis is to quantify the magnitude of peak wet weather flow with a 10-year return period on a statistical basis.

The Senior Civil Engineer overseeing the preparation of the planning study shall coordinate with the City Sewer Modeling Group for approval of the peaking factors to be used for design.

Peak Wet Weather Flow (PWWF): The peak wet weather flow (or design flow) for a gravity sewer main reach shall be determined by multiplying the peak dry weather flow (ref. Figure 1-2) by the appropriate wet weather peaking factor. The peak wet weather flow is the design flow for a gravity sewer main. It is determined at any point in the system based on the associated upstream average dry weather flow in the basis to that point times the peaking factor for wet weather.

Peak Wet Weather Flow = (Peak Dry Weather Flow) x (Wet Weather Peaking Factor)

1.3.3 Pipe Sizing Criteria

1.3.3.1 Hydraulic Requirements

Manning's formula for open-channel flows shall be used to calculate flows in gravity sewer mains. Manning's coefficient of roughness "n" shall be assumed to be 0.013 for all types of sewer pipe. Sewer grades shall be designed for velocities of 3 to 5 feet per second (fps) where possible. This is extremely important in areas where peak flow will not be achieved for many years. The minimum allowable velocity is 2 fps at calculated peak dry weather flow, excluding infiltration. Sewer mains that do not sustain 2 fps at peak flows shall be designed to have a minimum slope of 1 percent. Additional slope may be required by the Senior Civil Engineer where fill of varied depth is placed below the pipe in order to provide adequate slope after expected settlement occurs. The maximum allowable velocity shall be 10 fps and shall be avoided by adjusting slopes, by increasing the pipe diameter, or by utilizing a vertical curve transition to lower velocities per subsections 2.2.4 and 2.2.9.4. If the Senior Civil Engineer approves a velocity greater than 10 fps, the pipe shall be upgraded to SDR 18 PVC (standard dimension ratio polyvinyl chloride), concrete-encased VC (vitrified clay), or PVC sheet-lined reinforced concrete pipe.

TABLE 1-1
CITY OF SAN DIEGO SEWER DESIGN GUIDE
DENSITY CONVERSIONS

Zone	Maximum Density (DU/Net Ac)	Population per DU	Equivalent Population (Pop/Net Ac)
AR-1-1, RE-1-1	0.1	3.5	0.4
RE-1-2	0.2	3.5	0.7
AR-1-2, RE-1-3	1	3.5	3.5
RS-1-1, RS-1-8	1	3.5	3.5
RS-1-2, RS-1-9	2	3.5	7.0
RS-1-3, RS-1-10	3	3.5	10.5
RS-1-4, RS-1-11	4	3.5	14.0
RS-1-5, RS-1-12	5	3.5	17.5
RS-1-6, RS-1-13	7	3.5	24.5
RS-1-7, RS-1-14	9	3.5	31.5
RX-1-1	11	3.4	37.4
RT-1-1	12	3.3	39.6
RX-1-2, RT-1-2, RU-1-1	14	3.2	44.8
RT-1-3, RM-1-2	17	3.1	52.7
RT-1-4	20	3.0	60.0
RM-1-3	22	3.0	66.0
RM-2-4	25	3.0	75.0
RM-2-5	29	3.0	87.0
RM-2-6	35	2.8	98.0
RM-3-7, RM-5-12	43	2.6	111.8
RM-3-8	54	2.4	129.6
RM-3-9	73	2.2	160.6
RM-4-10	109	1.8	196.2
RM-4-11	218	1.5	327.0

TABLE 1-1
CITY OF SAN DIEGO SEWER DESIGN GUIDE
DENSITY CONVERSIONS (Continued)

Zone	Maximum Density (DU / Net Ac)	Population Per DU	Equivalent Population (Pop/Net Ac)
Schools/Public	8.9	3.5	31.2
Offices	10.9	3.5	38.2*
Commercial/Hotels	12.5	3.5	43.7*
Industrial	17.9	3.5	62.5*
Hospital	42.9	3.5	150.0*

Figures with asterisk (*) represent equivalent population per floor of the building.

Definitions:
DU = Dwelling Units
Ac = Acreage
Pop = Population

Net Acreage is the developable lot area excluding areas that are dedicated as public streets in acres. Gross Area is the entire area in acres of the drainage basin, including lots, streets, etc.

For undeveloped areas, assume Net Acreage = 0.8 x Gross Area in Acres

For developed areas, calculate actual Net Acreage.

Tabulated figures are for general case. The tabulated figures shall not be used if more accurate figures are available.

Population is based on actual equivalent dwelling units (EDU) or the maximum estimate obtained from zoning.

Conversion of Fixture Units to Equivalent Dwelling Units (EDU): The Water Meter Data Card, maintained by the Development Services Department, contains a table of plumbing fixtures that should be used for determining the equivalent dwelling units (EDU's) for the purpose of estimating the rate of wastewater generation in residential, commercial, or industrial areas. Currently, the basis for conversion is: 20 fixtures = 1 EDU and 1 EDU = 280 gallons of wastewater per day.

In high rise building areas, flow rates shall be based on the most current, adopted edition of the applicable Plumbing Code, assuming one lateral per area. The most conservative flow rate shall govern.

PUBLIC UTILITIES DEPARTMENT

PEAKING FACTOR FOR SEWER FLOWS
(Dry Weather)

Ratio of Peak to Average Flow*
Versus Tributary Population

Population	Ratio of Peak to Average Flow	Population	Ratio of Peak to Average Flow
200	4.00	4,800	2.01
500	3.00	5,000	2.00
800	2.75	5,200	1.99
900	2.60	5,500	1.97
1,000	2.50	6,000	1.95
1,100	2.47	6,200	1.94
1,200	2.45	6,400	1.93
1,300	2.43	6,900	1.91
1,400	2.40	7,300	1.90
1,500	2.38	7,500	1.89
1,600	2.36	8,100	1.87
1,700	2.34	8,400	1.86
1,750	2.33	9,100	1.84
1,800	2.32	9,600	1.83
1,850	2.31	10,000	1.82
1,900	2.30	11,500	1.80
2,000	2.29	13,000	1.78
2,150	2.27	14,500	1.76
2,225	2.25	15,000	1.75
2,300	2.24	16,000	1.74
2,375	2.23	16,700	1.73
2,425	2.22	17,400	1.72
2,500	2.21	18,000	1.71
2,600	2.20	18,900	1.70
2,625	2.19	19,800	1.69
2,675	2.18	21,500	1.68
2,775	2.17	22,600	1.67
2,850	2.16	25,000	1.65
3,000	2.14	26,500	1.64
3,100	2.13	28,000	1.63
3,200	2.12	32,000	1.61
3,500	2.10	36,000	1.59
3,600	2.09	38,000	1.58
3,700	2.08	42,000	1.57
3,800	2.07	49,000	1.55
3,900	2.06	54,000	1.54
4,000	2.05	60,000	1.53
4,200	2.04	70,000	1.52
4,400	2.03	90,000	1.51
4,600	2.02	100,000+	1.50

***Based on formula:** $\text{Peak Factor} = 6.2945 \times (\text{pop})^{-0.1342}$
(Holmes & Narver, 1960)

FIGURE 1-1

depths below the ground surface, in order of descending water quality. Potable water pipelines shall be located above both reclaimed water pipes and sewer mains, and reclaimed water mains shall be located above sewer mains. A minimum vertical separation of one foot shall be provided between the top and bottom surfaces of the pipes in the same street or easement.

1.4.2.3 Crossing Mains

A minimum vertical separation of 12 inches shall be provided between the top and bottom surfaces of crossing utility conduits and shall comply with the *State of California Department of Health Services Criteria for the Separation of Water Mains and Sanitary Sewers*. Separation measurements shall be taken from the outer most surface of any pipeline protection (i.e. concrete encasement or steel sleeve) which may be installed. Where the vertical separation is less than 12 inches, a request for design deviation (ATTACHMENT 2), with justification, shall be submitted for review. If approved, for pipes 12 inches or less in diameter, a 12-inch sand cushion, or alternatively a minimum 6-inch sand cushion with 1 inch neoprene pad shall be used. Separations of less than 7 inches will not be allowed by the City. For skewed main crossings, see Subsection 2.2.6. Mains crossing large facilities shall evaluate deflection across the span, changes in hydraulics due to change of slope, shear forces, and special joint designs to account for pipe movement.

1.5 PUMP STATION PLANNING CRITERIA

If at all possible, the construction of a sewer pump station is to be avoided. However, in cases where constraints such as topography and environmentally sensitive habitat dictate, a pump station may be necessary (Ref. Council Policies 400-13 and 400-14 – ATTACHMENT 1). The DESIGN ENGINEER shall analyze the planning area for the sewer system to minimize the number of units to be pumped and to design the shortest possible force main. In cases where only a small tributary area is to be served by a pump station, the City will accept the facility as public only if it can be shown that the capitalized cost of facility replacement and maintenance will not exceed 50 percent of the standard sewer fees for the area to be served. Otherwise, the pump station must be privately owned, maintained and operated. In cases where a pump station will be a public facility, specific criteria for the design, construction, and operational testing of sewer pump stations are given in Chapter 7.

1.5.1 Pump Station Design Capacity

The Pump Station Design Capacity shall be calculated as follows:

Pump Station Design Capacity (PSDC): Pump stations shall be designed to pump the calculated peak wet weather flow from the upstream tributary area.

Pump Station Reserve Capacity Factor (PSRCF): This is a safety factor that takes into account that service pumps will generally not be operating at their

full intended design capacity due to mechanical wear and the subsequent loss of efficiency, and increases in force main friction loss due to the deposition of solids and grit. The reserve capacity factor shall be 1.0 if two (2) hours emergency storage (Ref. Subsection 7.2.6.7) or six hours emergency storage (Ref. Subsection 7.2.7) are provided. Where this storage is not provided in design, then a reserve capacity factor greater than 1.0 shall be used and an appropriate factor shall be evaluated for approval, on a case-by-case basis, by the Wastewater Collections Division Senior Civil Engineer.

Pump Station Design Capacity = (Peak Wet Weather Flow) x (Pump Station Reserve Capacity Factor)

1.5.2 Private Pump Stations

Private pump stations (privately-owned and operated) serving more than one lot shall not be located in the public right-of-way. The capacity for private pump stations shall be determined in the same manner as for public pump stations. Station wet well detention times shall not exceed 4 hours. A planning study for the pump station outlining capacity of the pumps, equivalent dwelling units (EDU) served, capacity of the wet well, detention times, length and size of the force main, and provision of any odor control equipment shall be submitted for review to Water and Sewer Development Review, Public Utilities Department. Private pump stations shall require separate structural, mechanical, and electrical permits from the City of San Diego, Development Services Department, Building Review Division. However, private pump station plans are not reviewed for compliance with City of San Diego Sewer Design Guide Chapter 7 criteria. As such, it shall be the responsibility of the DESIGN ENGINEER to ensure that all private pump stations are adequately sized, have sufficient redundant measures (dual force mains, back-up power supply, auto dialer alarm system to a licensed plumber with 24-hour response, etc.), and comply with all applicable local, state, and federal regulations. In the design of such facilities, the DESIGN ENGINEER shall utilize sound engineering judgment to provide for an adequate design for any potential failure during the service life of the pump station. If a developer elects to construct a private sewer system including a sewer pump station, then a letter of agreement must be executed over all lots served in the subdivision if the pump station will serve two or more lots. A copy of this agreement is available at the City Plan Check Counter and the City Website http://www.sandiego.gov/mwwd/business/sewer. Also required is a recorded copy of the CC&R's for the home or business owners association, outlining the responsibility and maintenance requirements for the shared private improvements.

1.6 ZONE - DENSITY CONVERSIONS

Table 1-1 shall be used in planning studies to determine the equivalent

APPENDIX D

CITY OF SAN DIEGO COMMENTS AND RESPONSES

Discipline	#	Lead	Comment	Response
PUD-Water & Sewer Dev	**74**	Civil Sense	Sheet 7 (Central Ave Street X-section): Please label the Proposed 4" Sewer Force Main as temporary and private. Please also show dual 4" force mains. (New Issue)	Cross section for Public Street Central Avenue (STA 19+50 to STA 27+00 +/-) has been revised on Sheet 7 to call out and show proposed temporary private dual 6" sewer force mains.
PUD-Water & Sewer Dev	**75**	Civil Sense	Sheet 8 (West Ave): When accounting for pipe diameter size, there does not appear to be 10' separation distance (edge-to-edge) between the water and sewer mains in West Avenue. Please adjust utilities for 10' separation (clear). (New Issue)	The sections have been revised to provide 10 feet clear separation on Sheet 8.
PUD-Water & Sewer Dev	**76**	Civil Sense	Utility Plan: Please add the following note. ALL PROPOSED PUBLIC DOMESTIC WATER SERVICE LINE DIAMETERS ARE PROVIDED FOR CLARITY OF INTENT ONLY. ACTUAL SERVICE LINE DIAMETERS WILL BE BASED UPON THE PROJECTS APPROVED WATER METER DATA CARD. (New Issue)	Note has been added as Note 14 on Sheet 17 Note has been added as Note 15 on Sheet 18.
PUD-Water & Sewer Dev	**77**	Civil Sense	Edit Note No. 8 to indicate the private sewer main will convert to a public sewer main when: 1) the Southwind project connects to the sewer main in Private Drive O 2) a public sewer easement is dedicated between Private Drive E and O 3) an access easement is dedicated on Private Drive E (between Central Avenue and Private Drive O) 4) an EMRA requirement for all non-sewer utilities and surface improvements. (New Issue)	Note 8 on 17 has been revised to indicate when private sewer main would convert to a public sewer main.
PUD-Water & Sewer Dev	**78**	Civil Sense	Please provide station numbering along West Avenue and public Street A. (New Issue)	Stationing has been added along West Ave. and Public Street 'A'. See Sheets 10, 12, 16, 18 and 20.
PUD-Water & Sewer Dev	**79**	Civil Sense	Please show and label a private discharge manhole, prior to the force main connection to the public sewer main in Caliente Ave, and indicate a single pipe gravity flow from the discharge manhole to the public manhole. Please also, label a 10ft (minimum) long pipe from between the discharge manhole and public manhole. (New Issue)	The private discharge manhole and connection pipe between the discharge manhole and existing public sewer manhole is shown on labeled on Sheet 23.
PUD-Water & Sewer Dev	**80**	Civil Sense	Label the Sewer Force Main (Phase 1) as private. (New Issue)	Legend on Sheet 17 has been revised to call out Private Sewer Force Main. Call outs have also been provided along PVT. Drive D and central Ave.
PUD-Water & Sewer Dev	**81**	Civil Sense	Sheet 24: The city does not use 16" sized pipes for the sewer main. Please revise to 18". (New Issue)	The 16" sewer has been revised to 18" in Beyer Blvd as shown on Sheet 24.
PUD-Water & Sewer Dev	**82**	Civil Sense	Per Section 2.2.5.1 (Alignment of Sewers) of the Sewer Design Guide, "Sewers designed to serve properties on both sides of a street shall be located along the centerline of the street according to SDRSD M-22 and City of San Diego Drawing SDM-111". Please locate the proposed sewer to the centerline of the street and relocate water mains north of the sewer. (New Issue)	As confirmed by Martha Blake in our meeting on 8/21, there will never be development on either side of Beyer Boulevard since there are environmentally sensitive lands and conservation easements on both sides. Also, there is a 4 foot wide raised median almost the entire length of the street.
PUD-Water & Sewer Dev	**83**	Civil Sense	Please label the vertical separation between all utility crossings. (New Issue)	A note has been added to Sheets 24 and 25 regarding vertical separation between the public utilities.
PUD-Water & Sewer Dev	**84**	DWE	The city does not use 16" sized pipes for the sewer main. Please revise to 18". (New Issue)	Beyer Blvd. gravity sewer has been revised to 18" diameter SDR 18.
PUD-Water & Sewer Dev	**85**	DWE	Please label and reference all sewer lift stations as "Future Sewer Lift Station." (New Issue)	All figures and exhibits now reflect this labeling change.
PUD-Water & Sewer Dev	**86**	DWE	Page 4-1: Revise "21-inch to 36-inch" trunk sewer to "18" and larger." (New Issue)	Page 4-1 in the Specific Plan Sewer Study has been revised accordingly.

PUD-Water & Sewer Dev	**87** DWE	Figure 4-1, please adjust legend to coincide with the drawing. (New Issue)	Figure 4-1 (Land/Property Ownership) utilizes colors to differenciate the ownerships. It was determined the colors did not flatten correctly during the upload. The figure should now be able to be viewed with the correct color contrasting.
PUD-Water & Sewer Dev	**88** DWE	Exhibit A: Update size of proposed public sewer main to coincide with Appendix F. (New Issue)	Sizing has been corrected.
PUD-Water & Sewer Dev	**89** DWE	Exhibit A: there are two manholes labeled OM MH 43. Please check the manhole numbering. (New Issue)	The eastern OM HM 43 has been corrected to OM MH 42.
PUD-Water & Sewer Dev	**90** DWE	Exhibit A: Show and label the proposed public sewer main for the Southwind project. (New Issue)	The Southwind sewer main is now shown as proposed on Exhibit A.
PUD-Water & Sewer Dev	**92** DWE	The city does not use 16" sized pipes for the sewer main. Please revise to 18". (New Issue)	Beyer Blvd. gravity sewer has been revised to 18" diameter SDR 18.
PUD-Water & Sewer Dev	**93** DWE	Please label and reference all sewer lift stations as "Future Sewer Lift Station." (New Issue)	All figures and exhibits now reflect this labeling change.
PUD-Water & Sewer Dev	**94** DWE	Figure 5: Show the private force main connection to the public sewer system. (New Issue)	Figure 5 now shows the connection at Caliente Ave via an expanded window.
PUD-Water & Sewer Dev	**95** DWE	Figure 5: Please add an EMRA requirement for the private force main on Figure 5. (New Issue)	Figure 5 now indicates that an EMRA is required for the proposed private force main.
PUD-Water & Sewer Dev	**96** DWE	Sewer Study Summary (Existing Flows plus VTM 1, with Upgrades): Revise the existing 12" mains to be upsized to 15" for sewer segments M36S 115 to M36S 107 and M36S 107 to M36S75. (New Issue)	These segments are now shown to be upsized accordingly
PUD-Water & Sewer Dev	**97** DWE	Please discuss how odor control will be implemented for the sewer lift stations. (New Issue)	A brief overview and discussion of odor control is now inlcluded in both the Specific Plan and VTM 1 sewer studies.
PUD-Water & Sewer Dev	**98** DWE	Exhibit A: Show and label sewer segments M36S-115 to M36S-107 and M36S-107 to M36S-75 to be upsized to 15". (New Issue)	These segments are now shown to be upsized accordingly
PUD-Water & Sewer Dev	**99** DWE	Per email to applicant dated 4/5/2023, PUD requested the developer to perform an assessment report for the Otay Valley Mesa and Princess Park Pump Stations. Please provide an update. (New Issue)	The Assessment Report for Otay Valley Mesa and Princess Park Pump Stations are included with this submittal.

REVIEW COMMENT FORM

Name of Project: Southwest Village
Project Manager:
Project Engineer:
Plan Reviewer(s): Alex Ottens; Steven Bayooz

Design Phase:
WBS Number:
Date: 5/9/2024

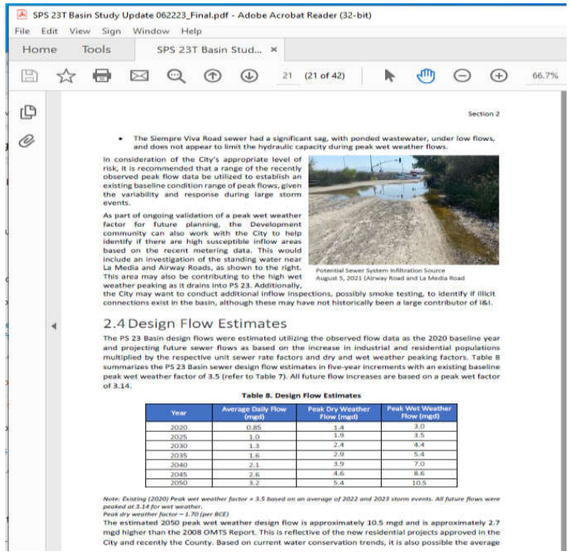
No.	Reviewer Initials	Reference	STA	Comments	Design Guide Reference (Section #)	Designer's Response	Column1	DSD - Water and Sewer Development Review Comments (6/5/2024)	Designer's Response2
	AO	WSA VTM 1	Sheet 13	Show parallel line on West Ave as to-be-abandoned in final buildout.		Will note that parallel line on West Ave will be abandoned at full Specific Plan buildout.	1	Address PUD's comment.	Figure 2 has been revised accordingly.
	AO	Water Study SP	Sheet 20/21	Report and exhibit lists Otay Mesa PS as to be abandoned. It is not currently functional, but is on PUD's priority list as a high priority replacement project. It will not be abandoned.		Will revise statement to "be replaced by others."	2	Address PUD's comment.	All relevant figures/exhibits and text have been updated to state "replaced" not "abandoned."
	AO	WSA VTM 1 Addendum 1	Sheet 15	Exhibit shows Otay Mesa PS as to be abandoned. As mentioned in previous comment, there is a plan to replace it.		Will revise statement to "be replaced by others."	3	Address PUD's comment.	All relevant figures/exhibits and text have been updated to state "replaced" not "abandoned."
	AO	WSA VTM 1 Addendum 1	Sheet 20	2023 peak demands were unusually low compared to previous years. The recorded numbers may not be representative of normal max day usage.		This flow meter data was sent in October 2023 from PUD with direction for it to be used to assess current capacity in 680 Zone. PUD had accepted an 800 unit threshold in Dec. 2023 for supplying the project via Caliente Avenue parallel water lines only (not Beyer Boulevard).	4	PUD's comment is informational. This comment is cleared.	--
	SB	WSA VTM 1 Addendum 1	Figure 2	It appears PA-12 and PA-14 are dead end with only one pipe serving them		PA-12 and PA-14 will be supplied by the parallel piping loop similar to the rest of the PA's in the VTM.	5	This comment is cleared.	--

REVIEW COMMENT FORM

Name of Project: Southwest Village
Project Manager:
Project Engineer:
Plan Reviewer(s):

Design Phase:
WBS Number:
Date: 5/9/2024

No.	Reviewer Initials	Reference	STA	Comments	Design Guide Reference (Section #)	Designer's Response	Column1	DSD - Water and Sewer Development Review Comments (6/5/2024)	Designer's Response2
		Specific Plan Sewer Study	Page 3-9	Based on the latest accepted flow projections from Sewer Pump Station 23 Basin Study dated June 20, 2023, the 2050 average dry weather flow of 3.2 MGD should be used, not 2.86 MGD as stated in the Southwest Village Specific Plan. The current peak daily dry weather flow to PS23t is currently at 1.5-1.7 MGD.		2050 ultimate sewer flows from PS 23 were sent to us by the City in June 2023. These flows have been used in the sewer studies since the time. Flows were stated as "Max Flow" and these are shown to be 10~11 mgd. A 10~11 mgd max flow equates to greater than a 3x total peaking factor for even 3.2 mgd. Confirm that the current offsite analyses are still acceptable? Per comment 3 in May 24, 2024 e-mail, the proposed pipe sizes (24-inch, 27-inch, and 33-inch) are adequate for PS23T ultimate flow diversion.	1	Per PUD, "The max wet weather flows of 10.5 mgd that they have been using is correct. I just commented on the average flow, which they stated at 2.86 mgd, It should be 3.2 as shown in the excerpt from PS23 Basin Study see snipped report. And flows to PS23 are currently at 1.5 mgd peak dry weather flow. The way I read their statement below is an average flow of 1.5 mgd to PS23." Address PUD's comment.	Page 3-9 has been updated to reflect the projected 3.2 mgd 2050 average dry weather flow as stated in the SPS 23T Basin Study.
		Specific Plan Sewer Study	Page 4-2	The City of San Diego is currently consulting with the City Attorney/City Legal Counsel regarding the Reimbursement Agreement.		Status	2	PUD reviewer is currently communicating with the city attorney and anticipates a statement from them in 2-3 weeks. Approval of the sewer studies (SP and VTM) will need to wait for city attorney's response or add a disclosure to both reports stating the reimbursement agreement is awaiting legal determination from the City's Attorney's Office.	All relevant studies will state that the reimbursement agreement is awaiting legal determination from the City's Attorney's Office.
		Specific Plan Sewer Study	Figure 4	Along Beyer Blvd, there are proposed public gravity sewers to be constructed, going from 15" to 18" (SDR 18 PVC), then decreasing to 15". Pipes normally increase in size in the downstream direction. Can the downstream proposed 15" sewer be upsized to 18"?		The 18" sewer in Beyer Blvd. is only proposed as 18" due to high velocity and available pipe size for SDR 18. Pipeline segment was initially proposed as 16" but was requested by the City to be 18" since 16" is not a valid sewer size. Even though the section is proposed as 18" diameter, the actual hydraulic flow in the section only requires a 15" diameter. We would request for the downstream section of Beyer Blvd. remain at 15" due to this exceptional reason for the 18" middle segment.	3	This comment is cleared.	Per the 8-6-2024 meeting with City PUD Staff, this 15" section is now proposed as 18".
		Specific Plan Sewer Study	Figure 4	Along Otay Mesa Rd, there are existing public gravity sewers that go from 24" to 10" to 12" to 27". Pipes normally increase in size in the downstream direction. Can the downstream existing 10" and 12" be upsized to 24"?		These segments along Otay Mesa Road north of Beyer Blvd. will only be utilized by the first 800 units of the project on an interim basis. These segments will be replaced as needed as unit counts increase and flow depth criteria is exceeded. PDF pages 27-31 of the VTM 1 Addendum 1 sewer study show these calculations. At buildout, the Specific Plan will not utilize these segments along Otay Mesa Road north of Beyer Blvd.	4	This comment is cleared.	--
		Specific Plan Sewer Study		The maximum allowable velocity shall be 10 fps and shall be avoided by adjusting slopes, by increasing the pipe diameter, or by utilizing a vertical curve transition to lower velocities per Sewer Design Guide subsections 2.2.4 and 2.2.9.4. If the Senior Civil Engineer approves a velocity greater than 10 fps, the pipe shall be upgraded to SDR-18 PVC, concrete-encased VC, or PVC sheet-lined reinforced concrete pipe (Sewer Design Guide 1.3.3.1)		Per e-mail from City on 6/5/2023, SDR 18 PVC is acceptable for the proposed gravity sewer main where velocities are greater than 10 fps.	5	This comment is cleared.	--
		VTM Sewer Study	Page 5	The development should use a PWWF peaking factor of 1.5 to the peak dry weather flows instead of 1.0 for onsite public sewer pipe sizing to account for future inflow & infiltration into the system as the system aged (>30 years later) and the lifespan of PVC sewer systems being 100 years.		A previous City comment from Jan. 2020 stated to use a 1.0 peak wet weather factor for onsite hydraulic calculations. Hence all reports/studies have used a 1.0 wet weather factor since that time of the comment.	6	PUD's comment is informational. This comment is cleared.	--


SPS 23T Basin Study Update 062223_Final.pdf - Adobe Acrobat Reader (32-bit)

File Edit View Sign Window Help

Home Tools SPS 23T Basin Stud... ×

21 (21 of 42) 66.7%

Section 2

- The Siempre Viva Road sewer had a significant sag, with ponded wastewater, under low flows, and does not appear to limit the hydraulic capacity during peak wet weather flows.

In consideration of the City's appropriate level of risk, it is recommended that a range of the recently observed peak flow data be utilized to establish an existing baseline condition range of peak flows, given the variability and response during large storm events.

As part of ongoing validation of a peak wet weather factor for future planning, the Development community can also work with the City to help identify if there are high susceptible inflow areas based on the recent metering data. This would include an investigation of the standing water near La Media and Airway Roads, as shown to the right. This area may also be contributing to the high wet weather peaking as it drains into PS 23. Additionally, the City may want to conduct additional inflow inspections, possibly smoke testing, to identify if illicit connections exist in the basin, although these may have not historically been a large contributor of I&I.

Potential Sewer System Infiltration Source
August 5, 2021 (Airway Road and La Media Road

2.4 Design Flow Estimates

The PS 23 Basin design flows were estimated utilizing the observed flow data as the 2020 baseline year and projecting future sewer flows as based on the increase in industrial and residential populations multiplied by the respective unit sewer rate factors and dry and wet weather peaking factors. Table 8 summarizes the PS 23 Basin sewer design flow estimates in five-year increments with an existing baseline peak wet weather factor of 3.5 (refer to Table 7). All future flow increases are based on a peak wet factor of 3.14.

Table 8. Design Flow Estimates

Year	Average Daily Flow (mgd)	Peak Dry Weather Flow (mgd)	Peak Wet Weather Flow (mgd)
2020	0.85	1.4	3.0
2025	1.0	1.9	3.5
2030	1.3	2.4	4.4
2035	1.6	2.9	5.4
2040	2.1	3.9	7.0
2045	2.6	4.6	8.6
2050	3.2	5.4	10.5

Note: Existing (2020) Peak wet weather factor = 3.5 based on an average of 2022 and 2023 storm events. All future flows were peaked at 3.14 for wet weather.
Peak dry weather factor = 1.70 (per BCE)

The estimated 2050 peak wet weather design flow is approximately 10.5 mgd and is approximately 2.7 mgd higher than the 2008 OMTS Report. This is reflective of the new residential projects approved in the City and recently the County. Based on current water conservation trends, it is also possible the average